

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

MICROSOFT TURNS 20

But Gates and company have just begun to tackle enterprise nets. See page 10.



Internet World heats up

IBM/Lotus to air hardware and software Web bundle.

By Doug Barney and Ellen Messmer
Boston

IBM and Lotus Development Corp. may still be newlyweds, but that isn't stopping them from getting busy on a soup-to-nuts Internet server bundle.

At Internet World here this week, IBM will announce a bundle of server hardware, OS/2 Warp Server software, a Web server, Lotus Notes and InterNotes Web

See IBM, page 8

Oracle, Sybase, other DBMS vendors ready network links.

By Barb Cole
Boston

Oracle Corp. will be the first mainstream database vendor to roll out a suite of tools for building Web-enabled applications, but it will not be the last.

At this week's Internet World conference, the Redwood Shores, Calif.-based database giant will take the wraps off three products for Web browsing and building Web-based applications

See DBMS, page 85

Critics take issue with fuzzy VLAN standards work

By Jodi Cohen

An IEEE committee defining a standard for virtual LANs may not have the best interests of buyers in mind.

The 802.1 committee has qui-

etly defined 21 requirements for interoperability among VLANs, which comprise software-defined groups of endstations located anywhere on a network.

But critics said the initial versions of the specifications are flawed and could result in products with weak security and administration capabilities, a lack of backward compatibility with existing network devices

See VLANs, page 84

IBM tackles WinNT nets

Net, systems mgmt. lines recast for Microsoft platform.

By Michael Cooney
Raleigh, N.C.

In a blunt recognition of market reality, IBM is porting most of its network and systems management products to Microsoft Corp.'s Windows NT.

Analysts said the move would give NT customers more powerful native tools for managing client/server environments. NT users would get centralized management over network devices, such as hubs and routers, and LAN-attached systems, as well as software distri-



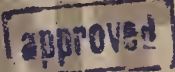
IBM's Don Haile says user demand is behind the development of the NT mgmt. platform.

bution and storage management facilities. The packages would ultimately make it easier for net managers to control their growing NT networks.

IBM officials last week confirmed that the company is developing NT versions of its SystemView products — including its premier management platform, NetView for AIX, and more than 30 other tools.

IBM will start by porting the low-end NetView for OS/2, which would let users manage

IBM GIVES IN



Company plots bold move to port its SystemView management tools to Windows NT from OS rival Microsoft.

Ported products include:

- ▶ NetView for OS/2 (for the low end)
- ▶ NetView for AIX (for the enterprise)
- ▶ NetView Distribution Manager (for software distribution)

New products considered include:

- ▶ SystemView for NT
- ▶ SystemView for Intel

LAN-based devices from NT, by the end of the first quarter. A new version of enterprise-savvy NetView for AIX will follow, giving

See Windows NT, page 85

Intel chips in with NT management

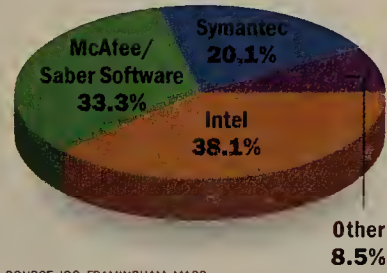
By Kevin Fogarty and Ben Heskett
Hillsboro, Ore.

Intel Corp. this week is expected to announce versions of its network management software that will give users greater control over their Windows NT networks.

Intel, a Microsoft Corp. crony, to date has been much chummier with Novell, Inc. on the management side. But the

INTEL ON TOP

1994 worldwide LAN management software market share



SOURCE: IDC, FRAMINGHAM, MASS.

company plans to ship by year-end an NT server monitoring agent for its LANdesk Manager suite and a "lite" version of the suite for managing small to mid-size NT nets.

"For LANdesk users, these products could really open up the doors to using NT more broadly in their networks. Before, they would have preferred to stick with NetWare for

See Intel, page 84

Amex strikes phone gold

Financial services firm to resell excess network capacity.

By David Rohde
Washington, D.C.

American Express Co. will soon transform one of its biggest network assets — the bulk discount agreements it has carved out

with long-distance carriers — into a moneymaking machine.

In a filing with the Federal Communications Commission, Amex revealed plans to use excess capacity purchased under its discount plans to provide telephone service to the public, initially via prepaid calling cards.

Amex's impending announcement could herald a wave of resale activity in corporate America, thanks to a recent FCC ruling that promises to ease problems that have plagued companies remarketing capacity on AT&T networks.

See Amex, page 14

UNSHACKLED AT&T IS NOW...

Loco for local loop

By David Rohde and Tim Greene
New York

Frustrated with the state of local telephone competition, AT&T Chairman Robert Allen last week declared that his company is willing to build its own local loops.

The statement came as AT&T set out to offer local telephone service in Connecticut in competition with Southern New England Telecommunications (SNET), the non-

Bell operating company that dominates the state.

Allen's statement appeared to endorse a strategy pursued by MCI Communications Corp., which is nearly two years into a \$2 billion effort to construct alternative local networks. Until now, AT&T officials have said they prefer to offer local service by buying switching and network capacity from BOCs at wholesale and reselling it at a markup.

See Local loop, page 14

Delve deeper into VLANs on Network World Fusion. Resources include:

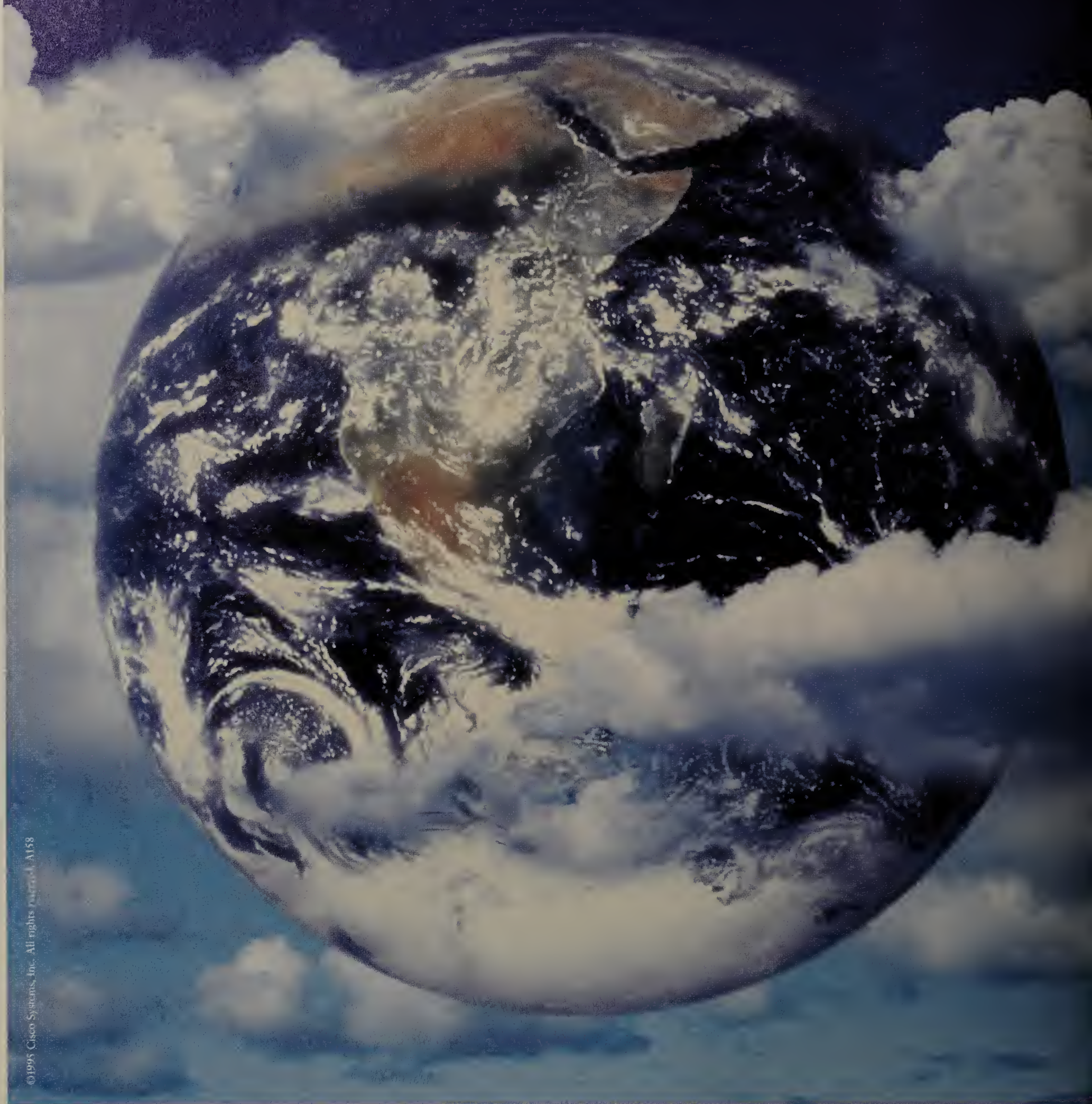
- A list of VLAN requirements as defined by the 802.1 committee
- A primer on VLANs
- A look at how one user is implementing VLANs

To access: Point your Web browser at <http://www.nwfusion.com>. From the main menu, select News+ then Front Page.

Get a Technology Update on VLANs. See page 49.

Access Network World Fusion using the number in yellow. See page 5 for details.

NEWSPAPER \$5.00



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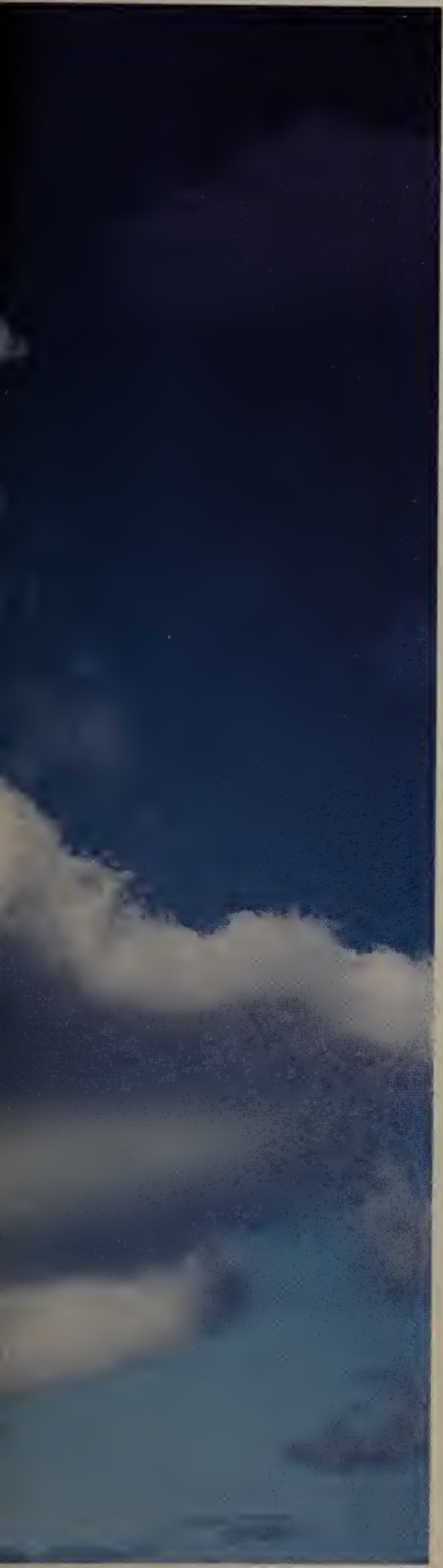
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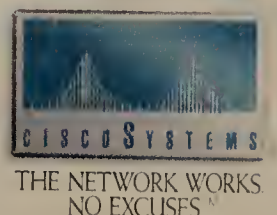
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Network



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This Week

Go on-line to learn more about the top stories in this issue. Aim your browser at <http://www.nwfusion.com> for these highlights and more.



News+

The Front Page:

- What's past is prologue as we dig up chronologies, historical accounts and other resources related to Microsoft's 20th anniversary.

The Technical Sections:

- Check into WANs & Internetworking to get a handle on the technical and financial issues surrounding Asymmetric Digital Subscriber Line technology.
- With all the talk about workflow, now's the time to take a free on-line "course" on the subject, in Client/Server Applications.



Forum

Your side: There's a new Web server that lets you search Usenet archives and even create "profiles" of posting habits. Valuable research tool or invasion of privacy? Voice your opinion in nwfusion.talk.

this week's pick

Struggling to deal with those pressing IS issues? Find out more about everything from the personnel demands of client/server migration to enterprise security on the Open User Recommended Solutions (OURS) Web site. Link to <http://www.ours.org> and select "Excerpts (Free)."

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At the welcome screen, click on Registration and follow the instructions. Subscribers, keep your NWF number — highlighted on the front cover's mailing label — handy during registration. Non-subscribers must fill out an on-line registration form.



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NetworkWorld

An IDG Publication

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Network bugs?

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NetworkWorld's Mission: To provide news and analysis that help network IS professionals deliver the network computing infrastructure and distributed applications required to meet evolving business needs.

News briefs, October 30, 1995

Banyan going back to VINES roots

■ Banyan Systems, Inc. is expected to announce this week that it is scaling back its Enterprise Network Services (ENS) program to focus on development of its core VINES operating system. The company will halt development of its ENS for The Santa Cruz Operation, Inc. operating system and take developers away from other ENS platforms to concentrate on delivering a revision of VINES every six months or so, Banyan officials confirmed.

The next major revision of VINES, 7.0, is expected to include ENS for Windows NT or another operating systems as add-ons. Although Banyan will not use ABUI to announce the change, it is expected to switch to a user-based pricing plan under which customers would pay for the number of users, and Banyan would deliver native VINES and ENS servers as needed, sources said.

In addition, the company is expected to take another shot at improving PC-Dialin, the oft-revised, much-maligned remote access product Banyan officials had previously decided to scrap in favor of something new.

IBM's OS/2 shell game

■ IBM is expected to announce this week its OS/2 Warp Workplace Shell, which sits on top of IBM's microkernel technology and enables developers to craft applications that are integrated so tightly they are essentially extensions to the operating system. IBM is encouraging developers to use the shell to develop applications for the PowerPC platform.

Well, at least not everyone's leaving

■ Following the high-profile departures of Chief Executive Officer Jim Manzi and Senior Vice President Rob Weiler, it should come as good news to customers of Cambridge, Mass.-based Lotus Development Corp. that former Chief Technology Officer John Landry will remain as a strategic consultant focused on Internet issues.

Industry observers expected an executive flight from Lotus after the company was bought by IBM in July. Manzi left earlier this month. Weiler left recently to join Wang Laboratories as its senior vice president and president of its software unit. Also, Lotus said last week that Kc Branscomb, senior vice president of business development, has resigned.



John Landry

Such a pretty picture

■ MCI Communications Corp. and Intel Corp. announced they are working to integrate Intel's ProShare desktop videoconferencing technology with MCI's conferencing service. NetworkMCI Conferencing allows individuals at as many as 23 locations to simultaneously share documents on their PCs and place audio-conference calls. The two companies plan to integrate ProShare 200 video software into networkMCI Business, a \$100 software package that launches MCI's conferencing and several other applications.

Separately, Intel announced an integration deal with Compaq Computer Corp. last week (see story, page 84).

Fast times at Cabletron

■ Cabletron Systems, Inc. in Rochester, N.H., last week confirmed that the company will announce by year-end a family of fast Ethernet products that will allow users to design a complete 100Base-T network. The products will include a fast Ethernet uplink module for existing 10M bit/sec switches, managed and unmanaged stackable 100Base-T hubs, fast Ethernet switching modules for the Multi Media Access Center line of switching hubs, as well as 100Base-T network interface cards.

Pentium Pro-motion

■ Intel Corp. this week will announce the next version of its core processor, dubbed Pentium Pro, in New York. Vendors lining up new servers to announce in conjunction with the chip unveiling include Sequent Computer Systems, Inc., AST Computer Corp. and UniSys Corp.

Users decry shortcomings of enterprise management tools

By Jim Duffy

Dallas

Like a sad refrain, network managers say they still are not getting integrated, enterprise-capable network and systems management tools from their vendors.

Splicing together management systems has become a time- and money-consuming process involving too much custom software programming, said users at last week's Enterprise Management Summit show here.

Vendors showing off "enterprise" management platforms at the Summit have failed to display much in the way of integration or true enterprisewide functionality, attendees said.

"The bottom line is that these things just don't work together," said Randolph Smith, project manager at United Parcel Service of America, Inc. "We've built a lot of 'glueware' to make this stuff work together."

Added Keith Finnie, senior net analyst at British Columbia Systems Corp. in Victoria, "We've had to do a fair amount of work ourselves to write proxies to get information out of [our] devices. Our expectations [from vendors] generally go down in order to be satisfied."

Both UPS and BC Systems have far-flung networks comprising computer systems, applications and network devices from multiple suppliers.

UPS' UPSnet includes 632 routers and 3,118 circuits, and supports 200,000 users, 24 million wireless calls a day and the shipment of 11.5 million packages a day, said Tom Ferro, manager of UPSnet. One of the tools UPS uses is IBM's NetView for

AIX, a key component of IBM's SystemView, which was crowned as the overall winner of the Summit (see story, this page).

BC Systems' net is made up of 1,500 routers that carry a mix of protocols as well as 70 Unix servers running custom, off-the-shelf and network management applications. The company uses SunSoft, Inc.'s SunNet Manager platform to oversee the net.

One of the biggest management challenges both companies face is filtering and correlating alarms — many based on proprietary formats — from the myriad devices on their networks. NetView for AIX and SunNet Manager cannot accomplish all that's needed, the users said.

"It's extremely difficult and expensive to correlate faults," Smith said. "We're not doing nearly as good a job at alarm correlation as we'd like to. And we're not seeing much help from vendors."

The inability of off-the-shelf products to filter and correlate alarms results in a lot of unnecessary information being presented in assorted formats on different screens at the manage-

ment console, Finnie said.

Some companies, such as Harris Corp. in Melbourne, Fla., and Southwestern Bell Telephone Co. in St. Louis, are concocting their own management tools to address such problems.

Harris is moving its network from X.25 to frame relay, implementing videoconferencing phasing out SNA in favor of TCP/IP, downsizing mainframe applications to Unix servers, and changing out Novell, Inc. NetWare and Banyan Systems, Inc. VINES servers for Windows NT ones, said Jim Odom, director of systems integration in the network services division at Harris. Because of the complexity and changing nature of the environment, Harris built its own management tools and applications to deal with it, he said.

Management platforms such as NetView for AIX, SunNet Manager, Hewlett-Packard Co.'s OpenView and Cabletron Systems, Inc.'s Spectrum mostly monitor the performance of net devices. Thus, vendor claims of enterprise management are misleading, said Baosheng Yang, process specialist at Southwestern Bell. "There is no single solution for everything," Yang said. "Can they look at a specific area? The answer is yes. But if you want to manage your environment as a whole, no." ■

IBM 'wins' controversial shoot-out

For the second straight year, IBM emerged as the overall "winner" of last week's Enterprise Management Summit shoot-out in Dallas.

The contest, however, was marred by the absence of market leaders and a controversial malfunction, which added to the uncertainty surrounding what the event actually proved.

The shoot-out pitted four management products — IBM's SystemView, Cabletron Systems, Inc.'s Spectrum, Bull HN Information Systems, Inc.'s Integrated Systems Management and Digital Equipment Corp.'s Polycenter Manager on NetView — against each other in seven management scenarios. Products were judged on how thoroughly they completed each scenario.

IBM's award was tarnished by the absence of Hewlett-Packard Co. and SunSoft, Inc. from the showcase. Together, these companies account for roughly 70% of the platform market. It was also tainted by the meltdown of Digital's Polycenter NetView product.

"Their platform wouldn't start," said John Poitevin, a member of the technical staff at US WEST Communications, Inc., and a shoot-out judge.

But Digital was the only vendor that had to compete immediately after another; in this case, Cabletron. IBM and Bull, meanwhile, did not immediately follow any other contestants, nor did any follow them.

"There was not enough time in between contestants for the environment to be reset," said Faye Allen, director of marketing for network integration software at Digital. "That affected our performance."

Judges were also hard-pressed to indicate exactly what IBM won. They all agreed the shoot-out does not prove that SystemView is the best platform on the market and cautioned that users should not make purchasing decisions based on shoot-out results alone.

Others said the shoot-out proved that, for 50 minutes, IBM was better at marketing its product than the other contestants.

Tame your curiosity about net management on Network World Fusion with added resources that include:

- A look at the specific criteria used to judge management platforms at last week's shoot-out
- A recap of last year's results
- Articles on the management platform wars

To access: Link to <http://www.nwfusion.com>. From the main menu, select News+ then WANs and Internetworking.

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Apps developers adapt products for life on Web

By John Cox and Ellen Messmer
Boston

Application developers are giving new life to their products by adapting them for use on the World-Wide Web. And at this week's Internet World conference, JetForm Corp. and Gradient Technologies, Inc. will outline strategies for doing just that.

JetForm's workflow system for creating and routing electronic forms will be extended to let companies post forms on Web

servers that can be downloaded by Web browsers containing a JetForm add-on application. For its part, Gradient is promising companies a way to give end users access to multiple applications via a single Web browser.

According to Brownell Chalmers, JetForm's vice president of business development, JetForm users will be able to post forms on public or private Web sites without losing the ability to route and process data. JetForm

forms are designed for workflow processes, unlike forms written to the Web's simpler HyperText Mark-up Language (HTML).

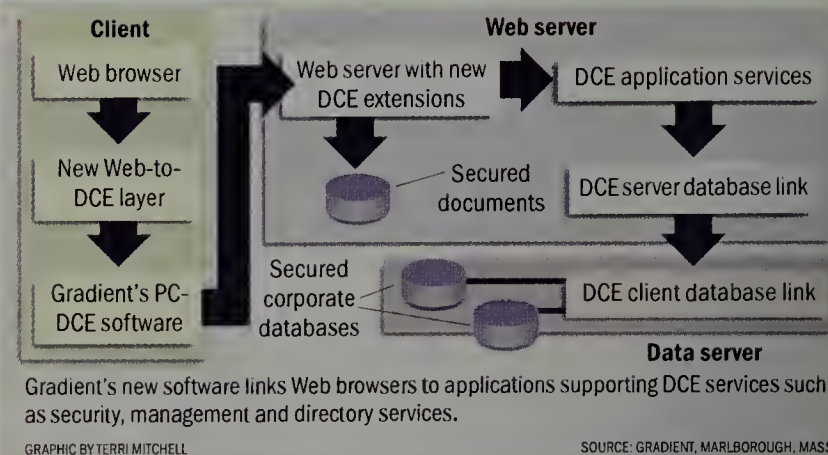
Bank of Boston Corp. is installing JetForm for capture and routing of administrative forms, said Bill Nowak, the bank's director of operating solutions. JetForm's Web version will let the bank post loan application forms on the Internet and process them internally.

Gradient sells software called PC-DCE that implements the Open Software Foundation, Inc.'s (OSF) Distributed Computing Environment (DCE) for Windows platforms. This week, the firm will announce plans for software that creates a translation layer between Web browsers and servers, and corporate networks using DCE.

Gradient's approach eliminates the need for corporations to deploy client interfaces to separate network applications. Instead, end users work with a universal client — the graphical Web browser — to access and manipulate these applications.

Pennsylvania State University was a catalyst for the new software. The university is planning to switch to a DCE security environment next summer and then begin, via the Web, to open its administrative information sys-

Opening applications up to the Web



'Net vendors get busy in Beantown

At the Internet World conference in Boston, announcements of corporate interest will include:

■ **UUNET Technologies, Inc.**, an Internet provider, is bundling Performance Technology, Inc.'s Instant Internet LAN gateway product with UUNET dial-up service and 20 electronic mail accounts. The bundle is designed to give businesses unlimited Internet access via a LAN at a fixed rate of \$130 for 28K bit/sec dial-up or \$215 per month for ISDN.

UUNET: (703) 206-5600.

■ **NetManage, Inc.** early next year will release the Chameleon Internet Software Developer's Kit, which includes Visual Basic OLE custom controls for letting users customize their NetManage Internet applications.

NetManage: (408) 973-7171.

■ **Webster Network Strategies, Inc.** has added support for Usenet and reporting tools for Microsoft Corp. Windows to WebTrack, its Internet monitoring, filtering and management application. It now runs on IBM's RISC System/6000 using AIX as well as Sun Microsystems, Inc.'s Solaris.

Webster: (914) 261-5503.

■ **The Information Industry Association** has formed a section called the Electronic Rights Management Group to explore ways to protect intellectual property rights on the Internet.

■ **Progressive Networks, Inc.** will preview the next release of its RealAudio software for audio on demand over the Internet.

■ **Argus Technologies, Inc.** will unveil the Argus Map Viewer browser and Internet map authoring tools for use by the real estate industry and other businesses.

Argus: (508) 875-5551.

■ **Kenan Technologies, Inc.**, whose billing software is used by carriers and large Fortune 100 companies, will unveil Unix-based customer invoicing and payments processing software that includes support for electronic funds transfer payments.

Kenan: (617) 225-2224.

■ **Frontier Technologies, Inc.** will make SuperWeb, its Web server that supports remote administration and managed access, available in beta form at its Web site, www.frontiertech.com.

■ **Qualcomm, Inc.** will introduce a 32-bit version of its Eudora E-mail software for Windows 95.

By Ellen Messmer

IBM

Continued from page 1

Publisher 2.0, a new tool that integrates Notes and the Web, sources said.

Novell, Inc. also plans to announce a Web server at the show — this one for NetWare.

While all the bundled products use OS/2, IBM is expected to offer a similar package for Microsoft Corp.'s Windows NT.

Such a bundle not only makes it easier to buy and install a LAN-based Web system, but it also takes care of integrating the Internet with Notes, sources pointed out. Pricing and availability were not disclosed.

To one large OS/2 shop, the news sounded great.

"Our staff is familiar with OS/2 Warp, and we'd like to be able to rely on those same skills to put up a Web server, as well," said Steve Goldman, director of technology at the Chicago Mercantile Exchange.

Anchoring the plan is the InterNotes Web Publisher 2.0, a new version set to ship in November that not only converts Notes documents to the Web, but also does the reverse — it turns Web

materials into Notes documents and converts Web hyperlinks into Notes links. Web Publisher, currently only available for NT, is being ported to OS/2.

The overall system will provide a central place for Web and Notes software as well as a common window, Notes, onto both types of data.

Browsing ahead

At Comdex/Fall '95 next month, Lotus is expected to announce its InterNotes Web Navigator, which the company will bundle with Notes Release 4.0. The Web browsing tool will allow users to create a mirror image of a Web page and import it into a Notes document. Once there, the page can be mailed electronically across the enterprise while maintaining live hyperlinks.

IBM not alone on LAN

Others also see demand for Web-on-a-LAN products. This December, Bedford, Mass.-based start-up American Internet Corp. will roll out SiteBuilder, a Web server product for Novell NetWare 3.11, 3.12 and 4.1 LANs. SiteBuilder was de-

signed to serve primarily as an internal corporate Web site.

"This is a Web server, essentially a NetWare Loadable Module, that runs under NetWare and takes advantage of NetWare Directory Services and NetWare symmetric multiprocessing," said Throop Wilder, American Internet's president.

Now in beta at Boston Edison Co., SiteBuilder includes a server-based IP address module, which eliminates the need to install TCP/IP software on every PC in the network.

And Novell will go into the Web swinging when it announces a NetWare-based Web server currently being referred to as InternetWare. It supports both IPX and IP nets, and makes it easy for current NetWare users to hook up a Web site. The server includes an IPX/IP gateway and connects with NetWare security to limit the access that Web users have to certain documents.

Novell is pitching InternetWare as a way to publish information on the Web or as inexpensive groupware for internal nets.

Senior Editors Michael Cooney and Kevin Fogarty contributed to this story.

NOVELL CUISINE

What do you think about Novell's new three-phase NOS evolution strategy? Join other network professionals in discussing the issue on Network World Fusion. Link to <http://www.nwfusion.com>. From the main menu, select Forum, [nwfusion.talk](http://www.nwfusion.com), then "Novell reorg."

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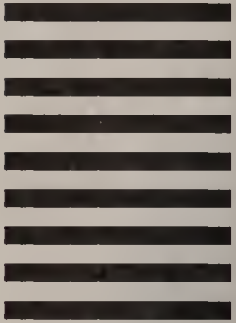
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No time for Gates to celebrate

In wake of his 40th birthday, Microsoft leader eyes enterprise nets.

By Peggy Watt
Redmond, Wash.

For a company that just blanketed the world with Windows 95 hype, Microsoft Corp.'s 20th anniversary and the 40th birthday of its chief Bill Gates this month were remarkably understated affairs.

That may be because the company has its hands full preparing for what may be its greatest challenge ever: servicing enterprise networks.

To do so effectively, say the corporate customers, Microsoft must offer products that are more robust and work better with other vendors' offerings. Also, they said the company needs to get rid of what has been dubbed "the Microsoft attitude" and partner more effectively with its customers.

Only of late has Microsoft really begun to compete as a networking products provider. In the past two years, Microsoft has introduced Windows NT, the BackOffice server application suite, Internet access tools and an on-line network service, among other things.

Enterprise focus

Desktop products were the company's priority when founders Gates and Paul Allen ported BASIC to the early microcomputer, the MITS Altair, in 1975.

Until recently, Microsoft's

steps into the networking arena have been tentative and mostly insignificant.

"I get many questions about our commitment to enterprise-level services and support," said Robert McDowell, Microsoft's vice president for enterprise customers. "Customers want to know if we are serious about the large enterprise. I get those questions a lot more than ones about this feature or that feature in a product."

McDowell joined Microsoft five years ago to build a consulting organization that serves corporate enterprise customers. He now has 700 members on his worldwide corporate service staff and partnerships with experienced organizations such as Digital Equipment Corp.'s consulting group.

Progress is evident; Novell, Inc. is feeling the bite of Windows NT, especially since Microsoft launched the attractively priced BackOffice bundle based on NT a year ago. Market research projections from both International Data Corp. and Dataquest, Inc. indicate that new Windows NT installations will overtake those of NetWare next year.

But still, as they evaluate and adopt Microsoft's enterprise technology, net managers voice common concerns.

Microsoft must "show that it's really enterprise class," said Andy Reho, associate department head for distributed systems technology at The Mitre Corp., a defense contractor in McLean, Va. "Microsoft has to show that its products work at more than 500-person firms, that they can really handle terabyte-size databases and big [symmetric multiprocessing] applications."

Reho credits Microsoft's Systems Management Server (SMS) as a first step that lacks enterprise management. Strengthening SMS with the technology Microsoft acquired recently from Network Managers, Inc. will ease a barrier to migration, Reho said.

Microsoft took away valuable lessons from LAN Manager and other earlier unsuccessful network products and has tried to do better with Windows NT, said Mike Nash, Microsoft's Windows NT Server product manager.

"[Windows NT] needed a new microkernel operating system that could be tuned, be hardware-independent and allow an API personality on top," said Nash, who worked on LAN Manager.

Microsoft has also learned patience, said Nash's colleague Rich Tong, general manager for product management in Microsoft's business systems division. "People think Windows was a success overnight. They remember 1990. They don't remember 1983 or 1985. It's like that with client/server," he said.

One problem Microsoft will continue to run into as it tries to crack the enterprise network market is that customers don't want to fix it if it isn't broken. Microsoft is learning that it needs a compelling reason to persuade customers to switch to Windows NT.

"Our support staff has years of experience on NetWare," said Mark Myers, a net analyst at Dreyer's Grand Ice Cream, Inc. in Oakland, Calif. He's loathe to disrupt 800 users and a half-dozen servers and hosts without a good reason.

However, he said the firm is absolutely standardized on Microsoft desktop applications, and future integration between Exchange and other desktop and server applications may provide incentive for Dreyer's to consider Windows NT.

The corollary to convincing customers that it's economically smart to adopt Windows NT and Microsoft's other enterprise net tools is accommodating users' existing systems.

"I envision a coexistence with Windows NT and NetWare," said Jerry Zickrick, manager of information services and net management for ProBusiness, Inc., a payroll service in Pleasanton, Calif.

"A one-stop shop is dangerous because you cannot grow unless your vendor grows. I assume Microsoft will continue to grow, but as long as intercon-

nectivity works, why switch?" he asked.

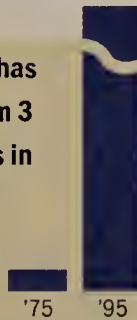
Microsoft representatives say they've learned the importance of interoperability and point to coexistence tools such as Windows NT File & Print Services for NetWare.

"I didn't like the way things were in the early LAN Man days, when the mission was to kill Novell," said Bob Kruger, Microsoft's director of technology marketing. "We have the right focus with Windows NT. We needed to put in ways to accommodate other computing environments."

The way Microsoft officials tell it, the company is making the interoperability efforts, forging the partnerships and training its people to meet the needs of enterprise net customers going forward.

Perhaps the young PC purveyors just needed experience. But Microsoft and its leaders aren't youngsters anymore; even Bill Gates has been working there for more than half his life. ■

Microsoft has grown from 3 employees in 1975 to 17,800 in 1995.



At its annual meeting Oct. 27, Microsoft reported 20 consecutive years of financial growth. The company posted \$1.4 billion in earnings on \$5.9 billion in sales this year.

Earnings \$1.4b

Sales \$5.9b



Microsoft memories

January
Bill Gates and Paul Allen write BASIC for the new MITS Altair and sign contract in July.

December
Year-end sales total \$500,000; there are 5 employees.

April
Microsoft and IBM introduce OS/2; Microsoft announces OS/2 LAN Manager.

January
Microsoft, Ashton-Tate and Sybase jointly introduce SQL Server 1.0 for OS/2.

September
Microsoft, IBM split on OS/2 and Windows development.

July
Microsoft launches Network Specialist Program to serve corporations.

March
Federal Trade Commission (FTC) begins investigating Microsoft for monopoly complaints.

July
• Microsoft, Justice Department agree to Consent Decree.
• Microsoft ships Windows NT and Windows NT Advanced Server.

February
Federal Judge Stanley Sporkin rejects Microsoft-Justice Department deal.

May
• Microsoft, Intuit call off merger.
• Sporkin overruled; Microsoft settles with Justice Department.

1975

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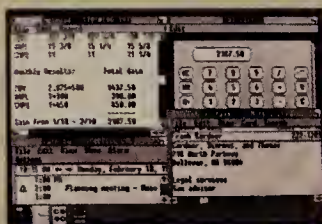
1994

1995

August
IBM introduces the IBM PC with PC-DOS licensed from Microsoft.



November
Microsoft unveils Windows.



April
Microsoft and DCA announce Communications Server.

October
Microsoft ships Windows for Workgroups 3.1.

August
FTC drops Microsoft's case; Justice Department picks it up.

September
Microsoft unveils BackOffice.



October
Microsoft, Intuit announce intent to merge.

August
Windows 95 ships. Also, The Microsoft Network is launched.

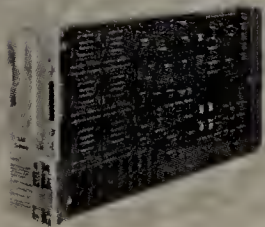
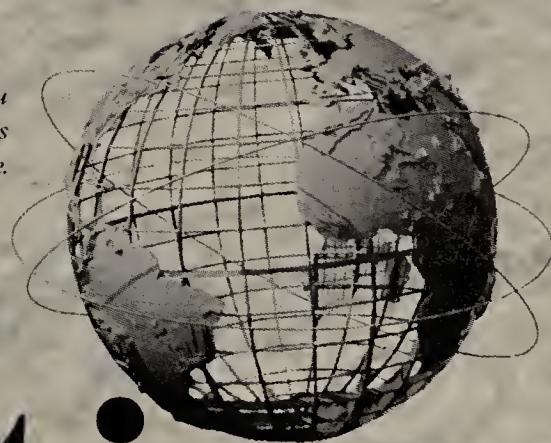




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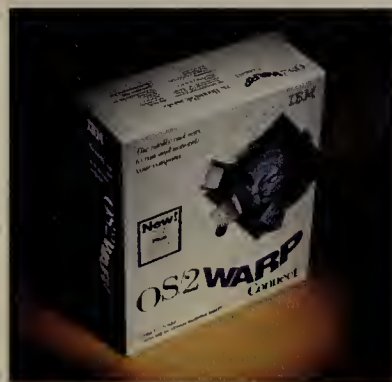
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Expert offers frame relay survival tips

By Tim Greene

Washington D.C.

Frame relay customers have new clout in negotiating long-term deals with phone companies now that the Federal Communications Commission has ordered carriers to tariff the service.

But net managers also have new pitfalls to look out for so they don't get trapped paying more than they had anticipated.

Hank Levine, a partner with Levine, Blaszak, Block & Boothby, a Washington D.C. law firm specializing in tariffs, offers this advice: If you are negotiating with carriers now, be particularly wary because the tariffs will take precedence over any new customized, negotiated agreement.

■ Demand to know whether the bargain they cut today will be overturned by the tariff the carrier has to file by mid-December.

"If you want to deal by contract now, make sure they will tariff terms that will be substantively identical so you don't lose anything," Levine said.

The FCC ruling is unclear on how the commission will treat existing special deals already struck with AT&T.

The ruling says the FCC will address these deals during tariff proceedings, but tariffs now take effect one day after filing "so there is no tariff review anymore," Levine said.

What to do? Wait and see, according to Levine. "The carrier

ers are unlikely to try to shaft people on their existing deals. But they haven't figured out what they'll do," he said.

■ Don't give up on package deals that include service and customer premises equipment (CPE).

While the ruling says tariffs must be filed on basic frame relay service unbundled from CPE, carriers can still offer those packages. You should weigh which is best for you.

■ When buying frame relay service, you should take all the precautions you now take for other tariffed phone services, such as voice, 800 and private-line.

The most basic rule: Read the tariff. If there are parts you don't like, make sure the contract you sign specifically excludes or modifies them.

"The general tariff terms are undoubtedly going to be outrageous and one-sided because they always are. But you get to modify them as part of your [negotiated agreement]," Levine said.

■ Take advantage of the fact that frame relay can be applied against contracts that call for minimum annual commitments.

Only tariffed services can apply to minimum annual commitment deals, and before the ruling, frame relay was untar-

rified.

That created problems if you had a private-line net and wanted to migrate the network to frame relay.

If those private lines represented \$2 million per year of a \$10 million commitment, you would be responsible for the full \$10 million, even though you were buying \$2 million less in tariffed service. And you would have to pay the cost of the new frame relay lines.

"Even though the customer might substitute one for the other in terms of technology, as a matter of law, you couldn't substitute one for the other toward your commitment," Levine said.

"With the new ruling, that has gone away. That's a very important opportunity for users."

■ If you want to make sure the service is tariffable, you should incorporate frame relay assembler/disassemblers in your networks.

This is because the FCC ruling seems to define two kinds of frame relay service: tariffable and nontariffable, Levine said. Basic service must be tariffed; enhanced service need not be.

If the carrier provides the protocol conversion to frame relay within its network, that makes the service enhanced. ■



Attorney Hank Levine gives advice on how to negotiate a tariff.

Local loop

Continued from page 1

But political observers were quick to question the timing of Allen's challenge. He made his statement the same week that a House-Senate conference committee began long-delayed deliberations to reconcile different versions of telecommunications bills that have been ruthlessly attacked by AT&T.

"It's not for real," said Alan Pearce, president of Information Age Economics, a Washington, D.C. consulting firm. "It's a bargaining chip."

Added Bob Rosenberg, president of Insight Research Corp., a Livingston, N.J., telecommunications firm, "I don't think Allen wants to pull wire down every street."

AT&T's other options include alliances with companies that already have rights-of-way and wire into the home, such as cable TV and power companies.

AT&T had been investing in telephony over hybrid fiber and coaxial CATV networks, but competitor Sprint Corp. has cornered the lion's share of the key cable alliances, Rosenberg said.

Jim Crowe, chief executive officer of competitive access provider MFS Communications Company, Inc., said Allen's statement means AT&T thinks legislators are serious about allowing the RBOCs to compete against AT&T in long-distance.

"If competition is inevitable, it's best to announce plans to compete and get after it," Crowe

said. "There's nothing more to be gained by being coy."

He said he thinks AT&T would need to lease local access rather than build it and hopes AT&T would buy it from MFS.

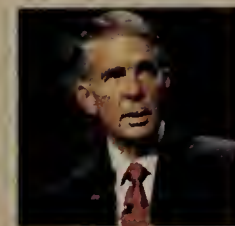
AT&T officials noted that Allen's statement covers a broad range of options that have been mentioned elsewhere. A spokesman said AT&T's official filing earlier this year to offer local tele-

phone service in Chicago — following Ameritech Corp.'s landmark agreement with the Department of Justice — left it the option of providing service directly or by resale.

"This announcement is not about building out a network," the spokesman said. Reports of active AT&T work in the local loop are probably related to AT&T's recent decision to mimic MCI and Sprint in building numerous Synchronous Optical Network (SONET) rings, he said.

But considering the option to build networks is necessary because in Chicago and Connecticut, as well as in Rochester, N.Y., regulators have pushed the resale idea only to see the dominant carriers thwart the concept through unreasonable rates, AT&T officials said.

Allen said Ameritech has used delay tactics in negotiations and Rochester Telephone Co.'s Frontier Corp. has established "unfair and prohibitive wholesale prices." He added that SNET has set residential wholesale prices at 125% to 270% of retail prices, making a resale offer by AT&T impossible. ■



"We will fight for the right to give our customers a choice for local service through every option open to us. That includes reselling local services, using alternate providers and building our own telephone network facilities."

AT&T's Robert Allen

Amex

Continued from page 1

There are now only a handful of Fortune 500 companies that resell capacity, which is principally purchased from AT&T under its bulk Tariff 12 deals. These companies and other resellers have complained that resale is difficult because AT&T delays processing orders and often arbitrarily changes the terms of contracts under which resellers purchase services (NW, July 11, 1994, page 29).

Now, as part of an FCC ruling that loosens some regulatory restraints on AT&T, the carrier has agreed to freeze the terms of most contract tariffs under which resellers purchase service. And it agreed to make quarterly reports to the FCC on its processing of reseller orders and establish an arbitration procedure with the Telecommunications Resellers Association (TRA) to resolve disputes.

Earlier this year, AT&T

streamlined the process by which resellers bring new customers onto their networks.

In the wake of the FCC ruling, big companies such as Caterpillar, Inc. and U.S. Steel International, Inc. have inquired about resale opportunities, said Ernest Kelly, TRA executive director.

"A lot of firms have had the potential to do this for some time but have not gotten into it," Kelly said. Amex "had been

buzzing around for a while" before filing on Oct. 17, he said.

An official announcement of Amex's new venture is expected shortly after its service rates, which far exceed its own cost of wide-area capacity (see graphic), take effect on Wednesday.

Amex will offer calls to more than 240 countries at rates as high as \$3.89 a minute. International capacity is considered key since prepaid cards are hugely

Reselling for fun and profit

Domestic rates to be charged by American Express to holders of its prepaid calling card:

Face value of card	Minutes of use per dollar	Equivalent rate in cents per minute
\$5-\$9	1.80	55.5
\$10-\$19	2.00	50.0
\$20-\$49	2.25	44.4
\$50-\$99	2.50	40.0
\$100+	3.00	33.3

Note = Duration of all calls rounded up to the next highest minute.

GRAPHIC BY TERRI MITCHELL

SOURCE: AMERICAN EXPRESS TELECOM, SALT LAKE CITY

popular among U.S. immigrants with families and friends abroad.

"We'll initially be entering the market with a prepaid telephone product," said John Taskett, president of American Express Telecom, Inc., a new Salt Lake City unit established to handle the telephone business.

Taskett cautioned that Amex's first offer may not necessarily be through AT&T resale since the company also has relationships with the other major long-distance carriers. But he hinted that the company's telephone ventures could expand into areas beyond calling cards and be carried over multiple interexchange carrier networks.

As one of the original Tariff 12

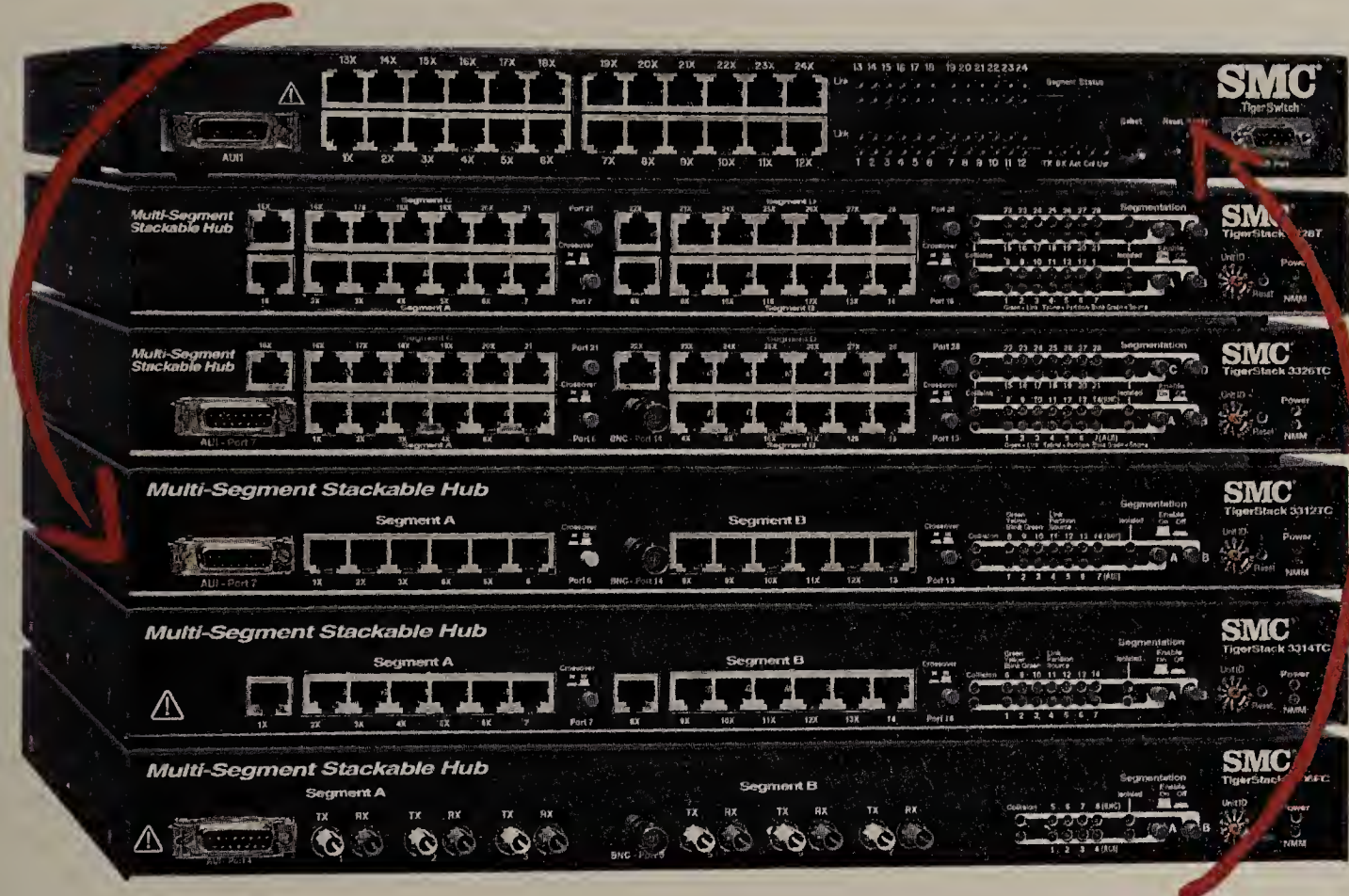
customers, Amex is believed to be purchasing capacity under Option 3 of the nearly 200 Tariff 12 calling plans in effect.

Option 3 currently offers continental U.S. rates ranging from 5 cents to 31 cents a minute, based on a variety of access factors, according to information supplied by the Center for Communications Management Information.

"This is not a difficult thing to get into if you have the management depth," Taskett said. "But the point of difference for us is outstanding customer service."

Resellers, not the underlying carrier, are responsible for dealings with the consumer or business that buys the service. ■

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Mobile computing

Wireless net boundaries crumbling

By Joanie Wexler

Instead of fighting for shares of a puny market, some wireless carriers are smartening up and tackling network coverage and interoperability problems.

Ameritech Cellular Services and RAM Mobile Data are launching separate efforts to tie their networks to other carriers' nets.

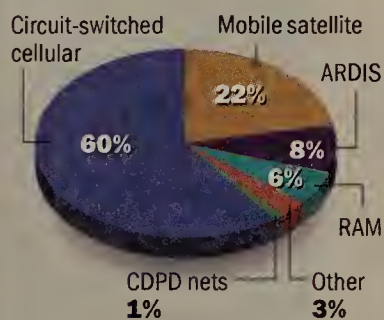
Ameritech plans to become network-neutral by reselling other carriers' packet radio services a la carte or bundled with its own Cellular Digital Packet Data (CDPD) offerings. Meanwhile, RAM intends to open up access to its packet radio net with analog cellular, satellite and wireline access services.

In sync with those efforts, NovaLink Technologies, Inc. in Fremont, Calif., will announce tomorrow the industry's first multimode wireless radio modem supporting RAM, cellular and satellite links on one \$500 Type 2 PC Card. The Go-Anywhere modem is slated to ship in the second quarter of next year.

Who's using what?

Packet radio net operators are desperate for anything — even interoperability — to hook users.

Wireless data market today*



* Percentages are rounded.

SOURCE: THE YANKEE GROUP, BOSTON

Users need access to multiple networks to fill coverage holes and to match the right technology to the application.

For example, RAM, ARDIS Co. and CDPD packet radio nets have been heralded for short, bursty applications such as electronic mail. However, these nets are not as appropriate for voluminous fax transmissions since users pay by the kilobyte and the networks are slow, said Karl Kaste, manager of technology assessment at Genentech, Inc. in

South San Francisco, Calif., a bio research firm long on the prowl for wireless services.

To address such concerns, Ameritech is in serious talks with both RAM and ARDIS to resell their services in areas where Ameritech falls short on CDPD coverage, according to Derek Podobas, assistant director of mobile data at Ameritech. CDPD has until now been Ameritech's key wireless data technology.

Ameritech has just begun benchmarking ARDIS, RAM and CDPD services against each other and plans to begin selling packages of multiple, integrated wireless services as early as December, Podobas said. "If CDPD is not the right choice, it is foolish for us to force-feed it to a customer," he said. "No one should be held hostage by a single network."

Ameritech will likely release those shackles by using Racotek, Inc. middleware, which interfaces to multiple wired and wireless nets, on servers in its own network and by running Teknique, Inc. gateways, Podobas explained. The middleware would allow, for example, a nationwide sales force to use the same application and graphical user interface throughout the country but different network services across regions.

RAM opens up

For its part, RAM is expected to announce this week that, like ARDIS, it is sanctioning wireline, satellite and cellular access into its packet radio network with a gateway service. This would make the RAM network usable to its customers who are out of RAM coverage by allowing them to access the network through alternative services that have a huge footprint.

These new access methods do not mean that RAM is equally embracing other networks, as Ameritech appears to be, analysts cautioned. Rather, the company is taking a RAM-centric approach that makes its own net usable by more people.

RAM is also expected to announce that it has revamped its airtime pricing structure to accommodate vertical markets — and that it is doing away with flat-rate pricing for the horizontal market.

That move will probably cause its traditional E-mail user base to take a pocketbook hit, said sources close to the firm. ■

COMMENTS?

See "How to reach us" on page 5.

Wang gives Windows 95 a new, sharper image

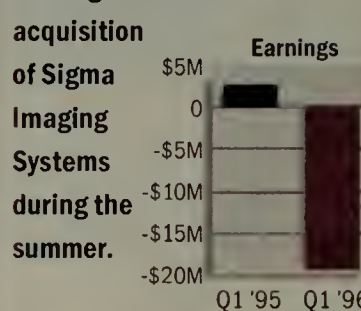
By Jon Skillings

New York

Document management on the desktop got a big boost last week at Imaging Expo when Wang Laboratories, Inc. unveiled imaging software for Windows 95.

The software provides imaging services to end users as well as a set of APIs based on Microsoft Corp.'s OLE object technology. It allows users to view and manipulate images throughout an enterprise, Wang officials said.

Wang last week posted a loss of \$19.9 million for the first quarter of its 1996 fiscal year, largely the result of a \$27.7 million charge against earnings to cover its acquisition of Sigma Imaging Systems during the summer.



The announcement was a follow-up to the agreement signed by Wang and Microsoft in April, under which Microsoft also bought \$90 million in Wang stock (NW, April 17, page 1).

The 32-bit software will be available worldwide by the end of the year, at no cost, through online services. Microsoft plans to include the software in future versions of Windows 95, though no specific time has been given.

With the Wang software, users can handle scanned or faxed documents in black and white, gray scale or color; manipulate the documents with scrolling, panning, zooming and other capabilities; mark up and add notes and comments to image pages; and integrate image documents into E-mail systems.

The offering could spark a rapid increase in the use of imaging at the desktop level, where, until now, it had little presence.

"This is pretty significant. If you're talking about mass-market appeal, now that [the imaging features are] potentially in your desktop operating system, you don't need to ask for it," said Tom Koulopoulos, president of Delphi Consulting in Boston.

The offering presents the possibility of "a de facto standard

for the industry, which has been fragmented by a lack of standards," said Jim Garden, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

Wang played up the standards angle. "Today, all vendors have a different way of storing simple things like annotations" in online documents, said Don Casey, president of Wang. "I can guarantee that if you have a Windows 95 system and I send you an annotation, you can see it; if I send you a fax, you can see it."

Show-goers liked what they saw. "It's fantastic," said Bob Wintermeier, an imaging consultant in Croton-on-Hudson, N.Y. "With this Wang product, you get the viewer embedded [in the

operating system] and can activate it off the desktop. If you can get it off the desktop, anyone can use it with great ease."

Developers, meanwhile, get OLE technology for adding image documents to database-driven and other line-of-business applications, and for building new applications. OLE Automation specs are available now; the other specs are due in January.

In the first half of 1996, Wang plans to provide connections between its document imaging software for Windows and its own line of image server products.

Separately, Wang announced that it has begun shipping Open/Workflow and Open/Image for Windows NT, its workflow and imaging server software for Microsoft's BackOffice and Windows NT Server.

Wang: (508) 967-5000.

Skillings is a correspondent at IDG News Service in Boston.

Consuming McDATA satisfies EMC's hunger for networking

By Michael Cooney

Hopkinton, Mass.

In a deal that could make it easier for network managers to tie big storage systems into high-speed networks, EMC Corp. last week acquired network switching vendor McDATA Corp. for \$230 million in stock.

If consummated, the deal will make Broomfield, Colo.-based McDATA a wholly owned subsidiary of the data storage vendor and give EMC users a new option for integrating storage systems into enterprise networks.

McDATA's 9032 Enterprise Systems Connection (ESCON) Director Model is a high-capacity, fiber-optic switch that provides dynamic switching between mainframes and peripheral devices. ESCON provides greater throughput for peripheral devices, such as storage systems, because it supports channel speeds up to 17M byte/sec, while traditional bus-and-tag copper connections are limited to 4.5M byte/sec.

McDATA also makes the ChannelScope Analyzer and ChannelScope Simulator tools for the development and testing of ESCON products.

IBM currently resells McDATA's ESCON product line,

but EMC officials said the acquisition should not change that relationship.

The bundling of the switch and storage products could give EMC a leg up against storage rivals and provide a boost for McDATA's technology, which some observers said was languishing in the market. That was the promise behind a similar 1993 merger between EMC competitor Storage Technology Corp. and net switch vendor Network Systems Corp. And analysts said that alliance has yielded little in the way of products.

"The deal brings EMC technology that it can use to bring storage products closer to the network," said Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington, D.C.

"McDATA wasn't doing anything with [the 9032]."

ANALYZING THE MCACQUISITION

EMC currently offers:

- The Symmetrix 5000 family of storage systems, as well as RAID products.

McDATA brings:

- The 9032 Enterprise Systems Connection (ESCON) Director Model, a fiber-optic switch that provides dynamic switching between mainframe channels and peripherals.
- The ChannelScope Analyzer and ChannelScope Simulator tools for development and testing of ESCON products.

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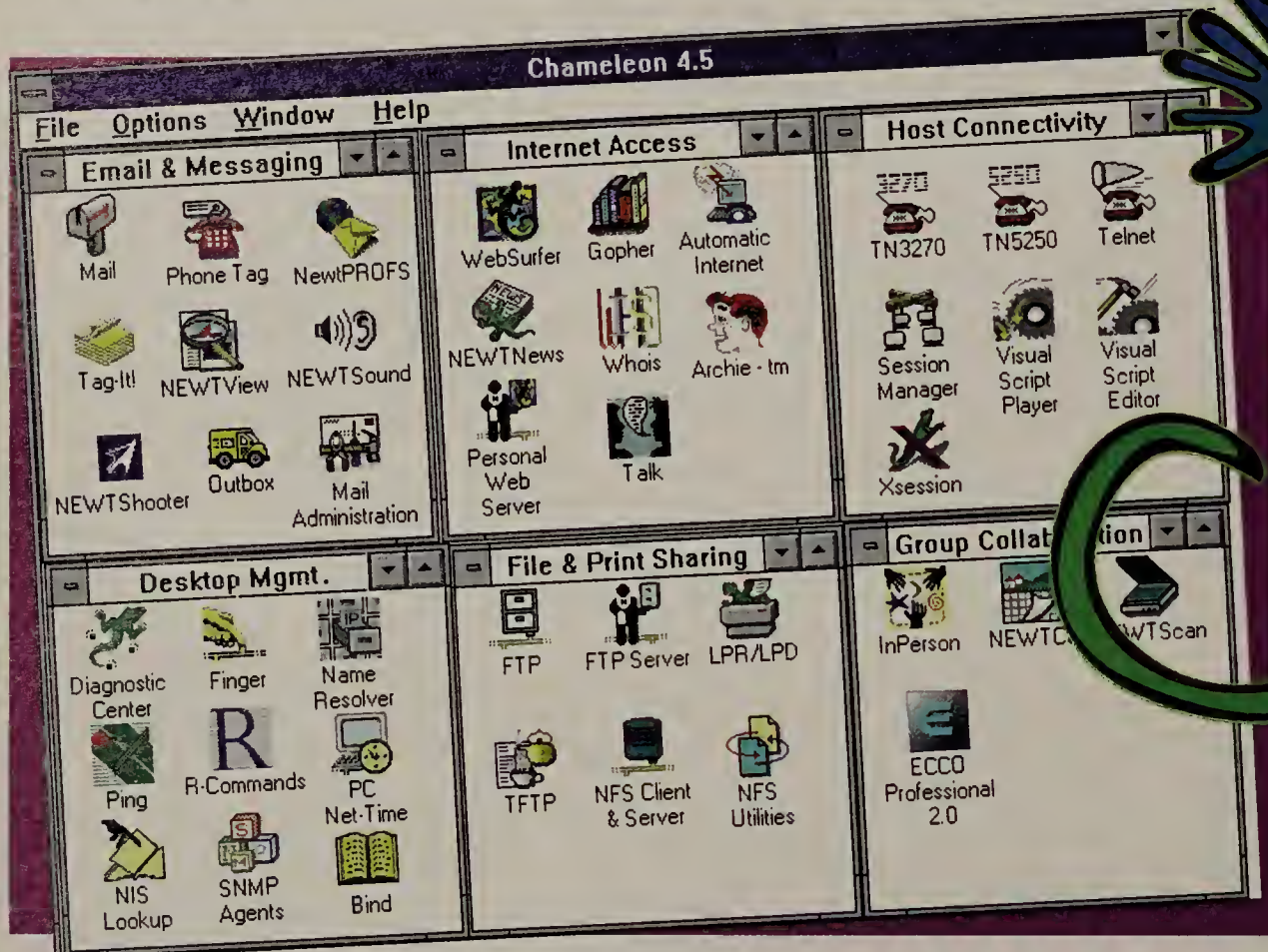
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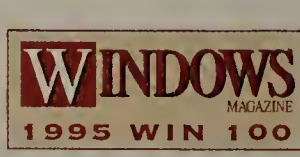
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Briefs

■ **CompuServe, Inc.** has announced support for **ISDN access** to its networks in Europe. Over the next year, it will roll out the service in Amsterdam, London, Paris, Zurich and several German cities, including Munich. More cities will be added later, the company said.

■ Users can get a deal on **Motorola, Inc.'s** Marco and Envoy wireless communicators if they make the purchase before Dec. 29. Motorola has teamed with its resellers to offer the devices — usually priced from \$1,300 to \$1,500 — for less than \$1,000. In addition, users who sign up for a 12-month wireless network airtime package with Motorola company ARDIS Co. will receive a \$200 rebate from ARDIS after six months of network use.

Motorola/ARDIS reseller info: (800) 894-7353.

■ **Nextel Communications, Inc.** has launched its **digital wireless service**, known generically as Enhanced Specialized Mobile Radio, in high-traffic areas of New England, including eastern Massachusetts, southern New Hampshire and Providence, R.I.

■ **Senate Commerce Committee** Chairman Larry Pressler (R-S.D.) chastised **AT&T Chairman Robert Allen** in a Capitol Hill meeting about a provocative new ad from long-distance carriers opposing **telecommunications reform**.

The ad features a congressman telling an elderly woman, "We're from Washington" and "We're here to fix your phone." The woman responds, "My phone's not broken."

Bill opponents, in turn, were outraged when CNN refused to run the ad, adding to the sour mood as a House-Senate committee that was formed to reconcile different versions of the bill finally began work last week.

Sprint turns on 800 switched data service

By David Rohde
Kansas City, Mo.

Customers seeking wide-area switched data service with reverse billing will soon be able to choose from among a full complement of offerings, as Sprint Corp. is set to become the last major carrier to enter the field.

The carrier's new Toll-Free Switched Digital Service is expected to largely match the capa-

bilities of MCI Communications Corp.'s Digital 800 service. But the service will lack a key feature of AT&T's offering that allows users to unify data and voice applications on a single 800 vanity number while retaining negotiated low rates on the regular voice calls.

All three carriers' services are gaining adherents by enabling users to dial in to LANs, video-

conferences and the Internet while reversing the charges. The 800 feature puts the entire telecommunications cost on the main user's bill, so remote users or even outside companies can access the same switched data or video application without racking up toll charges or worrying because they subscribe to a different carrier.

Sprint officials last week said they were not concerned about being late to the table. They have completed beta testing, and the service is already in production at users such as SmithKline Beecham, Inc. and Kinko's Copy Centers, Inc., according to the officials. Sprint has been holding off on an official announcement not for technical reasons, but because it has not completed a tariff rate schedule, they said.

Sprint's pricing task was complicated earlier this month by

AT&T's introduction of its 800 Multimedia service, which builds on the previously announced WorldWorx 800 service by letting users run data and voice services over a single 800 number while charging different rates (see graphic).

AT&T is the only carrier that
See Sprint, page 22

You get what you pay for

Under AT&T's revamped 800 Multimedia service, data and voice calls to the same 800 number are priced differently:

Data

22 cents a minute peak
19 cents a minute off-peak

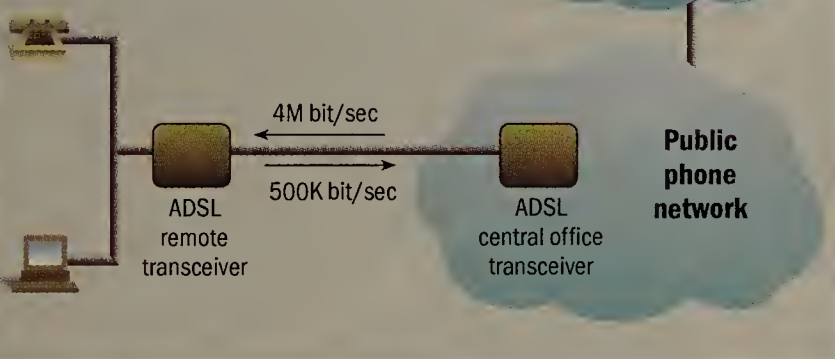
Voice

Megacom 800 rates (typically 6 to 10 cents a minute under negotiated contracts)

SOURCES: AT&T, BEDMINSTER, N.J., AND TELECHOICE, VERONA, N.J.

TO THE INTERNET — FAST!

Aware has produced the Internet Access Transceiver to enable high-speed Internet access over standard voice phone lines.



Modem can deliver video on demand in blink of an eye

By Tim Greene
Bedford, Mass.

Aware, Inc. has plugged a technology for video on demand into a modem that's specially designed to call up the Internet over regular voice phone lines — fast.

The modem can actually operate faster than most 'Net providers can deliver data today, so the offering will be ready when service provider delivery speeds increase, according to Thomas Howe, Aware's product manager.

The Internet Access Transceiver uses asymmetric digital subscriber line (ADSL) chipsets to provide data at 4M bit/sec into the user premise and 500K bit/sec back to the WAN. That assumes a distance of less than 12,000 feet from the phone company's central office (CO).

The technology is seen as a way to deliver high-speed services to user sites that do not have

access to optical fiber, coaxial or other high-bandwidth cable.

The modem, which is available in limited quantities for testing, requires a device at the user premise and at the telephone company CO (see graphic).

That means carriers have to buy into the technology and offer ADSL transport. Aware said regional Bell operating companies, competitive access providers and value-added network providers have shown interest but would not name which ones.

The technology was developed for delivering video-on-demand service to homes over standard phone lines and is being trialed by Bell Atlantic Corp. for that.

Beth Gage, broadband consultant for TeleChoice, Inc., a consultancy in Verona, N.J., said the device would let carriers deploy the service one line at a time and that it would be flexible

See Modem, page 20

General Magic makes Telescript appear for all

By Joanie Wexler
San Jose, Calif.

General Magic, Inc. this week will take a long-awaited step with its intelligent agent technology when it throws open the doors on its Telescript development platform.

Nearly two years after the launch of Telescript, the company will announce at its developers conference here that the code is available free of charge via CD-ROM or the World-Wide Web (<http://www.gen-magic.com>).

And in the wake of revealing an alliance with information search-and-retrieval service company Verity, Inc. last week, General Magic is expected to formally acknowledge at its conference plans to dispatch Telescript agents across the Web.

Telescript agents are intelligent software programs that run around networks finding information, filtering it and combining it with other pertinent data of specific interest to a user.

The company wants to try turning the Internet into a customized and manageable electronic marketplace (NW, July 10, page 6), said Adam Hertz, General Magic's Internet products group manager.

Net managers — particularly those involved in developing corporate Web sites — should check out General Magic for agent-enabling their enterprise nets and Web sites, advised Bill Abbondi, vice president of mobile computing and communications at BIS Strategic Decisions, a consultancy in Norwell, Mass.

Agents hopping from server to server that are able to collect, synthesize and combine information could render a Web site "more responsive to those accessing it, which could prove a strategic advantage," Hertz said.

Telescript Web tools will be available in a few months, he added.

The unleashing of Telescript is a milestone for General Magic, which has been caught between a rock and a hard place since it introduced the software in January 1994. As a small Apple Computer, Inc. spinoff, it has not had the resources to support scads of developers; but without developer buy-in, making the agents

See General Magic, page 20

Data Switch begins mining for new users

By Michael Cooney
Shelton, Conn.

Data Switch, Inc. has introduced the first in a family of products that will give users high-speed connectivity between servers and mainframes.

The company is announcing Open Channel (OC) 9000, which is aimed at users looking to build data mining, disaster recovery or enterprise backup applications. The offering is a communications gateway that will initially let users link Tandem Computers, Inc. on-line transaction processing (OLTP) machines directly to a 4.5M byte/sec mainframe bus-and-tag channel.

A second release, which will be available by next summer, will let users tie Hewlett-Packard Co. and Sun Microsystems, Inc. Unix servers directly to the bus-and-tag channel as well as to the I7M

byte/sec IBM Enterprise Systems Connection (ESCON) mainframe channel. ESCON is IBM's high-speed, fiber-optic channel connectivity technology.

"With the Tandem system connectivity, we are addressing the OLTP market, such as banks and credit card processors who need high-speed connectivity to the mainframe for their high-volume transactions," said Michael Ruggieri, vice president of strategic marketing for Data Switch.

OC 9000 sits between the mainframe and Tandem, Sun and HP devices.

The box supports as many as 32 slots, which can support

any combination of bus-and-tag adapters or SCSI boards for the Tandem boxes. ESCON and other interfaces for the HP and Sun boxes will also be able to be added to this mix in the future.

On the surface, OC 9000 competes with a number of mainframe channel-attached gateways, namely IBM's 3172 Interconnect Gateway, Bus-Tech, Inc.'s BT-I and others. But OC 9000 is unique in that it is not a gateway but a mainframe channel controller, emulating IBM's 3088 Multisystems Channel Communications Unit. The 3088 interconnects multiple mainframe channels in an IBM environment. Data Switch sells its own 3088-compatible box, Model 9800.

Software running on OC 9000 translates incoming data into the 3088's Channel-to-Channel (CTC) protocol and passes it on to the mainframe and re-



"With the Tandem system connectivity, we are addressing the OLTP market."

Michael Ruggieri

verses the procedure on the way out. For the Sun and HP units, OC 9000 will run a TCP/IP stack for multivendor connectivity, but its software will translate the TCP/IP to CTC for connectivity with the mainframe.

"Data Switch is enabling the types of applications, namely data mining, that let users employ Unix workstations and

other devices for heavy processing and enable the mainframe to be a cost-effective repository," said Anura Guruge, an independent analyst based in New Ipswich, N.H.

OC 9000 will be available in early 1996 and is priced starting at \$30,000.

©Data Switch: (203) 926-1801.

MCI opens frame relay network to small sites, mobile users

By Joanie Wexler
Atlanta

MCI Communications Corp. hopes to fan the growing enthusiasm for frame relay services with new access options to its HyperStream public data network aimed at small offices and mobile workers.

Let 'em in

Net access options for MCI's HyperStream frame relay service

Before

- ▶ Dedicated lines, 64K bit/sec to T-1
- ▶ Dial backup to dedicated lines

Now

Options above, plus:

- ▶ X.25-to-frame relay LAN-to-LAN gateway service
- ▶ Domestic 28.8K bit/sec LAN dial-up
- ▶ Telnet terminal-to-host, 9.6K to 14.4K bit/sec

Future

- ▶ Worldwide expansion of 28.8K bit/sec dial-up (1996)
- ▶ Circuit-switched cellular access (year-end)
- ▶ ISDN access (mid-1996)

The company has become the first among the top interexchange carriers to roll out a suite of dial access options.

The options — at least for the moment — put MCI ahead of principal competitors AT&T, Sprint Corp. and LDDS WorldCom (NW, Aug. 7, page 6), although MCI had been behind the curve (see graphic).

Previously, MCI offered only dedicated links into its HyperStream frame relay network, which accommodated sites large enough to justify the cost of those lines. MCI also offered dial backup for those links.

MCI's new options include:

- High-speed modem access into frame relay-interconnected LANs via a service called Remote LAN Dial. Charges for the 800 number-based service range from \$6 to \$12, based on usage.
- Telnet Connect, which allows users on dumb terminals to dial in to LAN-interconnected hosts

and gain some basic IP functionality from those LANs, such as electronic mail and interactive sessions. The service costs \$4.86 per hour, plus an X.25-to-frame relay gateway service charge.

■ XConnect, a gateway service between the X.25 network of MCI's joint venture partner, British Telecommunications plc, and BT and MCI's respective frame relay networks. Users in remote parts of the world where frame relay services are not yet available can now be connected back to the U.S. corporate frame relay network using X.25, said Bob Rasmussen, MCI senior manager of access services product marketing.

Down the road, it is likely that MCI will create a managed network service option for remote access, he added. ■

Scoop up more info about ADSL on Network World Fusion, including:

▶ A technical overview and bibliography.

▶ Descriptions of ADSL offerings from Motorola, Digital and other vendors.

▶ Papers on the technical and economic challenges facing ADSL.

To access: **Network World Fusion**
Point your Web browser at
<http://www.nwfusion.com>. From the main menu, select **News+** then **WANs and Internetworking**.

Modem

Continued from page 19

enough to carry video-on-demand service if carriers get permission from regulators.

The Aware modem meets ANSI standards, according to Howe, something other ADSL modems cannot claim.

At the moment, that is not a problem, according to a spokesman for AT&T Paradyne, which makes competing, noncompliant ADSL hardware. Virtually all ADSL products are in limited trials with carriers, so there are no interoperability problems yet that standards would solve.

A twisted-pair phone line has

a capacity far beyond the narrow 3-kHz channel used to carry an analog voice signal. But that capacity could not be used before because it was reserved to compensate for signal loss in the line. The ADSL modem uses that extra bandwidth and breaks it up into more than 200 channels, each fed by a separate modem stream.

How does it do that? "The math is pretty scary, and it isn't intuitively obvious. It isn't easy to describe," Howe said.

Narrowband interference from electrical appliances or shortwave radio transmissions can add noise to the phone line, which can disrupt a typical modem. With the ADSL modem, if noise disturbs one channel, the modem will not use it, thereby compensating for the interference.

Repeaters could be added to the phone line to extend the range of ADSL service, but that is not planned, Howe explained.

The current modem is intended for field evaluation by carriers, and each one costs \$2,500. Gage said carriers are looking for modems that can provision each line for \$500 to \$700.

But the company expects to be able to produce the modems for less money late next year, allowing pricing to drop in line with today's conventional modems, Howe said.

©Aware: (617) 937-1428.

services have not yet been announced.

General Magic also has not yet announced key partnerships with any Web browser companies, choosing to focus instead on building Telescript-enabled Web products targeted at those companies.

Ultimately, for agents to be successful, there must be something in the network for them to find, according to Pieter Hartsook, editor of "The Hartsook Letter" in Alameda, Calif. Electronic malls and agent components are developing independently of each other into "islands of usefulness" that must be linked to deliver on the General Magic dream, he said. ■

General Magic

Continued from page 19

pervasive enough to be useful has been nearly impossible.

Questions remain

Despite the release of Telescript, the promise of General Magic remains a question. Though the company has allied with many carriers, Telescript agents are operational in only one public network today: AT&T's little-used PersonaLink messaging and electronic mail service.

And while General Magic's Verity alliance holds promise, availability dates for Verity tools or Telescript-enhanced Verity

BusinessBriefs

GTE Telephone Operations said it will cut 4,700 employees by the end of the year. The company claims this is part of a three-year plan announced in 1994 to cut 17,000 jobs and reengineer to save \$1 billion. The cuts are part of an attempt to streamline and be more cost-conscious in response to the expected increase in competition for local telephone services. The company currently employs 68,000.

AT&T Wireless Services has purchased an equity stake in **CellPort Labs, Inc.**, a developer of technology used to create wireless LANs.

The research and development arm of **Deutsche Telekom** has established **Berkom USA, L.L.C.** for the purpose of pursuing strategic partnerships with U.S. firms. The goal is to speed Deutsche Telekom multimedia products to market. Berkom USA's initial focus will be on establishing international interoperability of ISDN and Asynchronous Transfer Mode technology for health care, financial services and on-line markets.

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Bank taps MCI's Network IVR

A bank holding company has become the first customer for a new MCI Communications Corp. service that removes the interactive voice response (IVR) units now commonly found behind 800 numbers and places them in the MCI network. The MCI service — known as Network IVR — differs from traditional network-based call-prompting services in that it is fully interactive with users' customer databases.

MCI user Wachovia Corp. in Winston-Salem, N.C., routes its 800 calls to MCI network nodes in Cedar Rapids, Iowa, and Downers Grove, Ill. These sites are linked by channelized T-1 lines to the bank's mainframe-based data repositories in Winston-Salem and Atlanta.

The Iowa and Illinois MCI nodes are outfitted with IVR units from Dallas-based InterVoice Corp., which communicate with the bank's data repositories over the T-1 links. Depending on the information punched in by customers in response to the voice prompts, the InterVoice gear can either complete a transaction without delivering the call to a Wachovia site or route the call to the proper location.

Wachovia chose this option largely because of its flexibility and scalability, explained Frank Faerber, senior vice president and manager of network services for the bank holding company.

"If you become facility-based, then you are bound to that location," Faerber said. It is more difficult to bounce an 800 call out of a call center once it has arrived at a specific call center's IVR system, he explained. And the typically heavy growth of ports on a premises-based IVR system tends to put pressure on the private branch exchange system associated with it.

By screening the calls through an IVR in the network, Wachovia is prepared to "tap different sources of labor" in case of a spike in call volume, Faerber said.

Breaking up is hard on AT&T OneVision

By Jim Duffy
Dayton, Ohio

The breakup of AT&T into three independent companies has cast the future of the carrier's OneVision network and systems management program into doubt.

OneVision, announced in June 1994, is a software and services offering intended to provide consistent, end-to-end management of disparate networking and computing equipment. At the heart of OneVision is agreement among AT&T business units to port their management applications to Hewlett-Packard Co.'s OpenView platform.

But now that AT&T's telecommunications services, equipment and computer manufacturing businesses are going to become three separate companies, OneVision is no longer relevant, according to analysts who advised AT&T on the program's rollout.

"As AT&T breaks up, the surviving pieces will each make their own decisions about what they want to do," said Mary Johnston

Turner, principal with Northeast Consulting Resources, Inc. in Boston. "The [Global Business Communications Systems] people have always had a very strong relationship with Cabletron. Even with the applications they brought out to run on the OpenView OneVision platform, they had always had a version that also ran on Cabletron [Spectrum]."

Getting on with it

But the OneVision strategy is going to go forward after the breakup, according to Tad Bodeman, director of OneVision marketing for AT&T.

He did acknowledge, however, that the independent companies would be free to offer products and services of their choosing, and have been free to do so even though OneVision was in place.

"I don't see any dramatic change in the industry to cause what will become our sister companies to dramatically change their strategy of building their management applications to the [OpenView] API set," Bodeman said.

In fact, some change has already occurred. AT&T has dashed its initial plans to port OpenView to Windows NT this year. Bodeman said he didn't know when AT&T will complete that port. ■

Sprint

Continued from page 19

can route toll-free data calls to one specific location, while voice calls placed to the same 800 number can be routed as usual among multiple call centers, analysts said. Sprint officials confirmed that at this point, they can only route calls based on specific instructions for a particular 800 number.

For certain kinds of users, this is not a concern, said Peter Hansen, a Sprint switched data product manager here.

For example, Global Village Communications, Inc. in Santa Clara, Calif., is an Internet access provider that now accepts both ISDN and voice modem connections over the same Sprint 800 number.

ISDN or switched 56K bit/sec connections are generally required by all the carriers for toll-free switched digital service.

However, traditional corporate users that employ a toll-free switched data service could be tripped up if they use their favorite 800 numbers for these new applications, according to Hansen.

The reason, ironically, is that carriers now routinely employ enhanced features that send 800 calls to different locations depending on the area code from which the call was dialed, the time of day it was made or other factors.

As a result, a data application could be accidentally rerouted to a call center with no ability to handle the connection.

"You have to be very careful

setting up enhanced features," Hansen said. He suggested that at this point, Sprint users should "go ahead and get a separate 800 number for data."

Service appeal

Both MCI and Sprint also need to improve their billing reports for the service to appeal to more users, said Daniel Briere, president of TeleChoice, Inc., a consulting firm in Verona, N.J. Currently, they merely flag data calls on the call detail reports, he said.

Sprint will probably end up charging slightly more for data than for voice, Briere said, "but the reality is they can't bill for it yet." MCI officially has a price differential but has waived the data surcharge under a promotional offering, he added. ■

INTERNETWORKING MONITOR

Who holds the keys to heaven's net?

The Clinton administration is talking about key escrow again.

I'm sure you all remember the sinking of the Clipper a while back. In that case, the administration proposed that your friendly government would hold onto the key you'd use to encrypt the phone call in which you whispered sweet nothings to your significant other. The government, of course, was only able to get the key with a proper court warrant — and the whole thing was voluntary.

The administration has now floated a new idea. It is sort of Clipper in a business suit instead of a cloak-and-dagger Clipper. The key escrow would be done by a bank instead of a government agency. Again, the whole thing would be voluntary. And the government would still be able to get the key by following typical procedures in obtaining a warrant.

Putting aside (for now) the moral issues, this proposal makes some sense. Businesses must have key escrow. It would be the height of folly to permit the president of some large corporation to encrypt all the corporation's business records in a key that only the president knows.

Businesses will have key escrow; it is only a question of who does the escrow function.

Businesses could do the escrow themselves, or they could purchase a service from a bank. The banks might have better controls and procedures, but the business might not know if the government was poking about and asked the bank not to mention the visit.

This would be a nonstory for the rest of us if there was not a nagging fear that, at some point in the future, the use of key escrow would be made mandatory. It does not make any difference if the current administration claims that it will never happen. No administration can indeed effectively bind the actions of a future administration or Congress.

So one has to operate on the assumption that

the fear will be realized and, in the name of national security, fighting terrorism or prosecuting pedophiles, the use of non-key-escrow encryption schemes will be outlawed.

Any such ban will be seen as expedient. Countering the dangers, some would claim, outweighs any threat to the privacy of the individual.

The existing ban on the exportation of encryption technology and any future requirement for the employment of key escrow will continue to keep the big software vendors from incorporating good encryption technology in their products.

Thus, someone who wants to use encryption has to make an effort to get the technology, rather than having it built into their software.

The overall idea that the government may want to make it impossible for two citizens to hold a private conversation is quite troublesome. We used to be able to go out into a field and whisper in each other's ears; technology is taking this ability away from us.

More than 2,000 years ago, the Chinese philosopher Lao-tzu wrote, "Heaven's net is indeed vast. Though its meshes are wide, it misses nothing." Are we at the point where governments have the hubris to assume that they are equal to the builder of heaven's net?


Although technology is taking the ability to whisper to a friend away from us, technology can also restore that same ability, if permission to use it is not taken away.

Disclaimer: Harvard has been accused of arrogance but not (as far as I know) of usurping the authority of the builder of heaven. In any case, the above represents my own views.

Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached via the Internet at sob@harvard.edu. Bradner shares this space with Daniel Briere and Christine Heckart, whose column will appear next week.



Scott Bradner



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Local Networks

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Briefs

■ **Olicom USA, Inc.**, a LAN equipment vendor in Plano, Texas, last week announced three GoCard PC cards that provide portable computer users with LAN adapter and fax/modem capabilities in one card. The GoCard for token-ring users supports data rates up to 14.4K bit/sec, and the Ethernet card supports data rates up to 28.8K bit/sec. Also, Olicom introduced a 28.8K bit/sec fax/modem PC Card that lets users access electronic and other services.

The GoCard for token-ring LANs is priced at \$549, the Ethernet card costs \$499, and the Internet access card is priced at \$349. The cards are available now. Olicom: (214) 423-7560.

■ **Luxcom, Inc.** last week rolled out its new **IsoEthernet products** for desktop videoconferencing and other multimedia applications. The products adhere to the IEEE 802.9a isochronous Ethernet standard, commonly known as IsoEthernet.

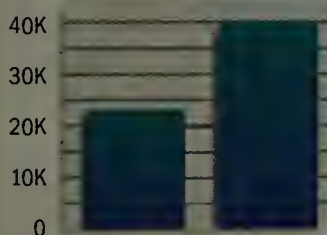
The IsoMax family includes a 12-port switching hub, IsoEthernet adapter cards and a server. A complete system will ship in December for about \$16,000. Luxcom: (510) 770-3300.

■ **LAN hub and adapter card vendor Compex, Inc.** in Anaheim, Calif., last week introduced a 12-port **100VG-AnyLAN hub** that lets users migrate from 10M bit/sec to 100M bit/sec while preserving existing Category 3, 4 or 5 unshielded twisted-pair cabling.

The VG 1412 AnyLAN hub is priced at \$125 per port and is available now. Compex: (714) 630-7302.

100VG-ANYLAN VOLUME

Hub port shipments for '95



SOURCE: IDC, FRAMINGHAM, MASS.

Download
TSAPI technical specs via
Network World Fusion. Link
to <http://www.nwfusion.com>. From the main menu,
select **News+** then **Local Networks**.



Novell hears the call for telephony

Company lays out the road map for the future of its NetWare Telephony Services.

By Kevin Fogarty
San Jose, Calif.

Novell, Inc. last week laid out plans to make NetWare servers act like private branch exchanges and vice versa.

The company is bolstering its

NetWare Telephony Services (NTS) strategy for computer-telephone integration (CTI) with a collection of offerings, including new APIs for giving electronic mail and other LAN applications links to telephony systems.

The announcements are an attempt to make CTI — an expensive technology used most heavily in large call centers — cheap and easy enough to use for the bulk of NetWare customers, according to Ron Cully, product-line manager for Novell telephony products.

Early next year, Novell will release software code-named Communication Platform Services (CPS), a Dynamic Data Exchange-based set of APIs for giving applications from Novell and other vendors access to telephony features.

The APIs will allow users and third-party developers to CTI-enable Novell's GroupWise E-mail product and PerfectOffice suite,

Lotus Development Corp.'s cc:Mail, and Microsoft Corp.'s Microsoft Mail and Microsoft Office.

The middleware, for example, will let users sitting at their desktop computers highlight a person's name or phone number within an application and then click a button to initiate a call.

To make CTI applications easier to set up, Novell is teaming with Dialogic Corp., which will combine a voice processing card for NetWare servers with a NetWare Loadable Module from Novell.

The combination will let NetWare users retrieve voice mail messages via their computers. See Telephony, page 33

Remote LAN access

Symantec tackles both Win95 and Windows NT remote users

By Michael Csenger
Cupertino, Calif.

Network managers providing remote LAN access can soon choose a single client software package to support all users in a combined Microsoft Corp. Windows NT and Windows 95 environment.

In mid-November, Symantec Corp. will introduce PCanywhere32, a 32-bit client application for remote Windows 95 and Windows NT users that gives them access to desktop computers at the home office or to a centralized remote access server. The offering builds on Symantec's 16-bit edition of PCanywhere.

Outdoing the competition

Other vendors' client software today runs under either Windows 95 or Windows NT, but not both, said Michael Kerman, Symantec's group product manager.

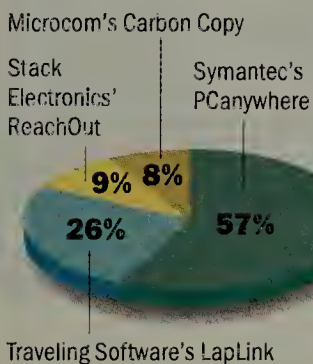
PCanywhere32 provides remote control connectivity, which essentially mirrors a user's desktop applications on a remote computer. Users log on to their desktop computer using PCanywhere32 and actually run applications there, while PCanywhere32 transfers the changing screen display to the remote computer.

The software also gives users access to the remote node connectivity technology built into Microsoft's operating systems. Remote node connectivity transfers actual data from a central server to a remote computer, enabling the remote user to run applications locally and dial in to

the corporate LAN for access to files and databases.

Symantec's new software differs from other remote control packages in the way it links remote users. Other remote control clients tap into the desktop computer's video driver in order to transfer screen images to the remote PC, according to Kerman. This shackles overall performance to the video driver and card capabilities, and causes a host of interoperability problems since there is little standardization among video components, he said.

REMOTE LAN CLIENT SOFTWARE SHARES



Based on a total of \$147 million in 1995 revenue.

GRAPHIC BY TERRI MITCHELL SOURCE: PC DATA, RESTON, VA.

Symantec has devised a way to connect to video memory at a higher level in the desktop PC. "We've completely eliminated dependency on the video cards," Kerman said.

This change, along with other new features such as screen caching, lets PCanywhere32 launch remote applications two to six

See Symantec, page 30

NOVELL'S NETWORK TELEPHONY ROAD MAP

Q1 '96

- Easier-to-use TSAPI spec for switch vendors
- Middleware to link applications to a telephony server
- Enable remote access to a telephony server

Early '96

- DDE-based API for desktop applications

Second half of '96

- Integrate voice services into TSAPI

NetEdge clears up transparent LAN service woe

By Michael Csenger

Research Triangle Park, N.C.

NetEdge Systems, Inc. today will announce efforts to make carrier-based transparent LAN services more secure and robust.

Transparent LAN services are offered by carriers as a way to link native LANs at wire speeds over Asynchronous Transfer Mode nets. These services are most popular in large cities, where customers can connect offices spread across town using Ethernet, for example, at 10M bit/sec between all LANs.

NetEdge offers equipment that links customer LANs to the carrier ATM net. The company is announcing improved software for its ATM Connect (ATMC)

edge router to make the device a more effective transparent LAN platform. While the enhancements are designed for carriers, transparent LAN service users should be the real beneficiaries.

The ATMC is a bridge/router that converts Ethernet, token-ring and FDDI traffic into ATM cells, mixing all the traffic over a single high-speed pipe.

But until now, the router could not be counted on by transparent LAN service providers to segregate traffic from different customers, according to Doug Green, NetEdge product manager.

NetEdge has addressed the shortcoming now with Release 1.5 of the firm's Secure MultiAccess software, Green said. The software provides a secure closed user group to each customer — one ATMC edge device in the basement of a building could support as many as 16 customers. See NetEdge, page 29

NET RESULTS

Skip MacAskill and Melinda Le Baron



Windows 95: It just can't be avoided

One of the nice things about living in a democratic society is being able to say no. With a few exceptions, we can simply refuse to do something if we so desire.

Alas, that is not true when it comes to Windows 95. What is arguably the most overhyped software release in computer

history (although you do have to admit that the "Start Me Up" commercial was pretty cool) is becoming a reality in corporate nets.

Network managers worldwide are trying to figure out the best way to transform their Windows 3.1 environments into Windows 95 strongholds.

If net managers do not bring Win95 into their environments, the operating system will find its way in the back door — bundled with nearly every new PC and installed directly by end users themselves.

Despite the obvious technical benefits Win95 has over its predecessor, net managers will face a number of implementation planning issues. Net managers will also need to cope with the effect that the operating system change has on other aspects of their IS infrastructures, including applications, networking, hardware, application development, software licensing, training and technical support.

But the news is not all bad. According to a Gartner Group cost analysis, Win95 will lower the ongoing cost of desktop ownership for most Windows 3.1 users.

The study shows that the five-year total cost of hardware, software, operations, administration and support for a desktop user will fall from \$41,439 per user for Windows 3.1 to \$35,859 per user for Win95 — a 13% savings.

Achieving these cost benefits, however, will require an up-front investment. Gartner estimates the cost of migrating to Win95, exclusive of additional hardware and new 32-bit applications, will range from \$206 to \$706 per user. Included in these costs are migration planning, acquisition, help desk upgrades, installation, end-user training and increased technical support for new users.

Even though most Windows 3.1 users will initially be able to run Win95 on existing hardware, net managers need to acknowledge that these 8M-byte Intel Corp. 486-based systems are running short on time anyway. The applications market will also change rapidly as users move aggressively to Win95-branded 32-bit applications.

Microsoft Corp. itself will lead the charge with Office 95, a 32-bit desktop productivity suite that includes new versions of Word, Excel and PowerPoint. And be assured that the independent software vendors will soon flood the market with new 32-bit applications.

This will have a snowball effect, since these new applications will also bring about an immediate need for more memory and additional hard-disk space.

We could argue that Win95 was the most intensely tested software of all time, but despite that, we do not expect the initial version to be bug-free.

We strongly recommend that users wait for a first bug-fix release before broadly deploying Win95. That release — which Microsoft refers to as a Tune-Up Pack — will likely be delivered in 1996.

Until then, start the migration planning process to handle the expected upgrades in memory, disk space, applications and hardware. And keep a sharp eye out for end users who attempt to install their own copies outside the purview of your company's phase-in plan.

Le Baron is a research director and MacAskill a senior research analyst in Gartner Group, Inc.'s Network Computing Infrastructure group. They can be reached by E-mail at inquiry@gartner.com or by phone at (203) 316-1111.

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HP targets net storage shortages with archive server

By Jodi Cohen

Boston

Hewlett-Packard Co. has unveiled a cost-effective archive server here designed to help PC LAN managers solve the all-too-familiar problem of disk-space shortages.

The HP SureStore Archive Server family allows companies to add 20G to 100G bytes of optical storage space directly to a Novell, Inc. NetWare or Unix-based net without bringing it down.

Unlike most storage devices that attach to the net file server, HP's device comes with an Ethernet adapter that lets it con-

The 20G-byte device can support as many as 50 users, and the rest of the models support as many as 100 users.

The HP SureStore Archive Server is well suited to users that need to share large libraries of data for applications such as document management.

Chuck Klucko, systems engineer at

Goldco Industries, Inc., a custom designer of conveyors for the food and beverage industry in Loveland, Colo., has been beta-testing the server in his NetWare environment for about eight months.

He is saving time and money by using the server to store complex drawings on-

line, rather than using a magnetic optical storage device that was hooked to a stand-alone computer.

Klucko figures he can easily save his company \$50,000 per year in labor costs using the archive server, which lets users pull up files right from their desktop.

Pricing for the HP SureStore Archive Server family, which will ship in November, ranges from \$8,950 to \$22,500.

©HP: (800) 826-4111.



Klucko says HP's archive server has cut the time it takes end users to access files down to 1 or 2 minutes, whereas it used to take 6 to 10 minutes.

nect to a network via a wiring hub. Before, net managers needed to buy new hard disks and system RAM licenses for their file servers, and take the servers down to reconfigure them — an expensive proposition considering the downtime.

The HP servers come configured with 5¼-inch magnetic optical disks and include jukebox management software.

NetEdge

Continued from page 25

with no chance of accidentally sending traffic to the wrong account.

NetEdge's software goes beyond the traditional firewalling found in most routers, Green said. "A router will firewall according to protocol type, but not according to different customer groups," he said.

The problem is that most products support multiple users by filtering traffic through a large, shared forwarding table to individually assigned ports. But Release 1.5 provides a separate bridging table for each customer group. "Think of it as a virtual bridge for each customer mapped directly to circuits over the ATM link," Green said.

A further benefit is that each customer group can be modified or given a different level of support without affecting other customers attached to the device.

The new software also supports switched virtual circuits (SVC) and IP routing over ATM RFC 1577.

Available now, Release 1.5 costs \$2,500; SVC support costs an extra \$1,500.

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Legato releases backup software that supports NT servers and Mac clients

By Jim Duffy
Palo Alto, Calif.

Legato Systems, Inc. has expanded the scope of its storage management software by unveiling versions for Windows NT

servers and Apple Computer, Inc. Macintosh clients.

NetWorker for Windows NT enables users to set up Windows NT systems as workgroup or enterprise backup servers.

It provides backup and protection of file system, name space, registry, event log and access control list data. It enables users to configure Windows NT workstations as central storage management administration consoles from which they can establish and enforce policies for enterprisewide backup.

The other new offering, ClientPak for Macintosh, allows Macintosh users to access NetWorker servers for storing and

recovering data. Backups can be scheduled to run as automated operations that are transparent to Macintosh users, Legato officials said. And Macintosh users can recover their files without administrator assistance.

Legato already offers NetWorker and ClientPak packages for a variety of clients and servers, including Unix, NetWare, DOS, Windows and OS/2. Any mix of clients can work with any server or mix of servers because the architecture of NetWorker and ClientPak is common across all operating system environments, Legato officials said.

LEGATO BACKUP BRIEFING

Product	Price
NetWorker for Windows NT	\$995-\$1,495
ClientPak for Macintosh	\$150 for individual licenses; \$1,500 for an unlimited usage license

Both products will be available in December.

Blood Systems, Inc. of Scottsdale, Ariz., plans to install Legato's Windows NT server software as part of a big-time move from NetWare to Windows NT, said Tom Rowan, the blood bank's IS manager.

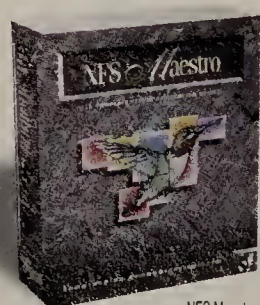
"What we want to do is standardize our tape management system across all platforms and have a single picture when the operators have to mount tapes or restore something," he said, noting that the company will have a mix of servers during the transition period. "They don't have to familiarize themselves with the different tape management systems that are out on the market."

NetWorker for Windows NT costs from \$995 to \$1,495. ClientPak for Macintosh costs \$150 for individual licenses and \$1,500 for an unlimited usage license. Both of the products will be available in December.

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- NFS Maestro for Windows & DOS includes a 32-bit VxD-based TCP/IP with BOOTP and DHCP



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Symantec

Continued from page 25

times more quickly than other client software, Kerman said. For example, a new Color Scale option lets users receive black-and-white images of what might otherwise be long, slow 16.7 million-color desktop displays.

Newly automated configuration features and an on-line QuickStart button make the software easier to administer and use, Kerman said. "We had to redo the user interface to comply with Windows 95, so we added a lot of spit and polish that make programs a lot easier to use these days," he said. "Remote client software has typically been too complicated for a lot of end users."

The software will be available in early December for \$149; users of the earlier Windows and DOS versions can upgrade, for a limited time, for \$59.95. The package includes a parallel port cable for faster synchronization of laptop and desktop files back at the main office.

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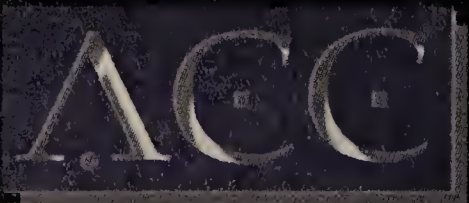
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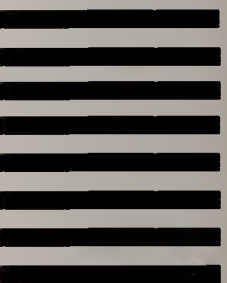
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Telephony

Continued from page 25

and log on to the LAN with a phone, among other things.

Novell also is planning an enhancement to NetWare that would allow users dialing in from the road or branch offices to access PBX and CTI features, such as conferencing and call transfers. The company will announce details for the project early next year.

In addition to the more user-directed enhancements, Novell will release a series of specifications and APIs to make it easier for developers to build NTS-compatible products.

CPS, which will be included in Novell's NET2000 set of APIs for providing access to NetWare services, will serve as the primary CTI integration software for developers.

Novell will also introduce an API defining how speech-to-text and speech-recognition applications can function across NetWare LANs. It will be available in the first quarter of next year.

In addition, Novell will release a specification that defines a standard order in

which PBXs should handle call-control functions that might be part of a CTI application.

The enhancements will go a long way to improve the chances for Novell's Telephony Services Application Programming Interface (TSAPI). TSAPI, which defines a way to tie PBXs into NetWare LANs, is the set of low-level APIs on which all Novell's other CTI efforts are based. But according to analysts, few TSAPI-

enabled switches or applications are in use.

"CTI is important because, really, workgroups are small call centers," said Jim Burton, analyst at Boston consultancy C-T Link, Inc. "We want a common database to call from and to have information about a call pop up on a screen before we answer the call. That would improve our efficiency whether we're a call center or a power user."

To date, NetWare-based CTI has been held back by Novell's dependent relationship with AT&T. The fact that Novell is issuing a lot of new APIs and tools shows that it is starting to take more control over the situation, Burton said.

AT&T is expected to port much of the new CTI software released by Novell to other operating systems, including Unix and Windows NT.

©Novell: (800) 638-9273.

Business Briefs

LAN switching vendor **Alantec Corp.** of San Jose, Calif., reported record revenue of \$13.8 million for its third quarter, more than double the \$6 million it generated last year during the same period. Earnings were also at an all-time high for the quarter, more than doubling from \$1.1 million in 1994 to \$2.9 million. Alantec attributed the strong showing to sales of the company's second-generation PowerHub 7000, 6000 and 4000 switching hubs, which together contributed 78% of earnings for the quarter.

Separately, Alantec recently expanded its management team, appointing **Paul Schaller** to the newly created position of vice president of business development. Schaller will help Alantec take advantage of the switching market's growth by identifying and securing strategic partnerships with major customers, channel partners and others. Schaller has been with Alantec since 1993 as vice president of marketing.

Proxim, Inc., a wireless LAN vendor in Mountain View, Calif., enjoyed explosive growth for its third quarter. Proxim announced that revenue for the quarter was \$5.9 million, more than twice the \$2.4 million posted for the comparable period last year. Earnings zoomed to \$482,000 from \$14,000 in the third quarter of 1994.

The company's record results can be traced back to increased demand for Proxim's 2.4-GHz RangeLAN2 wireless LAN products, which represented 72% of total revenue in the third quarter.

Fore Systems, Inc. of Pittsburgh showed that the Asynchronous Transfer Mode market continues to gain momentum, as it reported soaring financial results for its second quarter for fiscal 1996 ended Sept. 30. Revenue totaled \$38.2 million, better than twice the \$15.5 million reported in the previous year's second quarter. Earnings were \$3.8 million, more than double the \$1.5 million posted for last year's second quarter.

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Client/Server Applications

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Briefs

■ **The On-Line Analytical Processing (OLAP) Council** last week announced the completion of a draft API for linking front-end access tools to OLAP data sources. The draft API will be released for comment by year end.

OLAP Council: (800) 474-6527.

■ **Sterling Software, Inc.'s** Applications Development Division is now shipping *Key for Workgroup*, a client/server development tool set that includes tools for **workflow modeling**, business process reengineering and process management. The goal is to let users redesign business processes and, via the software's repository, implement these in new applications. The product starts at \$25,000 for all components and four concurrent user licenses.

Sterling: (404) 231-8575.

■ **Informix Software, Inc.** in Menlo Park, Calif., last week acquired San Francisco-based **Stanford Technology Group, Inc. (STG)**. Terms were not disclosed. STG markets multidimensional data access and on-line analytical processing tools, which will be integrated with Informix's flagship database.

Informix: (415) 926-6300.

■ **PictureTel, Inc.** in Danvers, Mass., has unveiled *Live PCS 200*, a desktop **videoconferencing** system for Windows 95 PCs. The system was jointly developed with Compaq Computer Corp. and includes an H.230-compliant plug-in board with an ISDN interface. The product is due in early 1996 for \$1,995.

PictureTel also will resell a version of **PolyCom, Inc.'s** T.120-compliant document conferencing projector.

PictureTel: (508) 762-5000.

Intersolv bags middleware vendor

Plans to integrate TechGnosis' SequeLink into its virtual data warehouse scheme.

By Barb Cole

Rockville, Md.

Intersolv, Inc. last week shored up its data warehousing strategy by acquiring Brussels, Belgium-based middleware vendor TechGnosis International, Inc. for about \$80 million.

TechGnosis' SequeLink — server-based middleware that gives end users access to multiple data sources — will become the high-end component of Intersolv's virtual data warehousing strategy.

In addition, Intersolv is looking at how to integrate messaging technology contained within SequeLink with its development tools and PVCS software configuration management system, said Kevin Burns, chairman and chief executive officer at Intersolv.

SequeLink, renamed DataDirect SequeLink, should help Intersolv further differentiate its virtual data warehouse from similar offerings and from the many traditional data warehouse products. Unlike physical data warehouses, which pull data from networked applications and databases into a central storehouse of information, virtual data warehouses let users query

multiple databases scattered across a network.

Intersolv's virtual warehouse offering currently consists of DataDirect SmartData, a client-based middleware layer based on the Open Database Connectivity (ODBC) protocol that culls data from more than 35 databases,

code-named Purveyor, designed to support more large-scale decision-support applications. Purveyor will be incorporated in a future release of DataDirect SequeLink, expected in about six months, according to Burns.

Such software would let administrators set up a three-tiered architecture for data access, where information from multiple databases is collected and joined on a server before being returned to a client, resulting in better performance and less net traffic.

Intersolv's current virtual data warehouse employs a two-tiered architecture in which the information from server databases is returned to the client, where it can be joined with other data.

Large apps deployment

Analysts said the acquisition would enable Intersolv's middleware products to be deployed in larger scale applications.

"TechGnosis has some strong server-based middleware that will give Intersolv's ODBC tech-

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Employees: 150

1994 revenue: \$13.8 million

Primary product: SequeLink client/server middleware for accessing heterogeneous databases

Key competitors: Information Builders, Sybase

plus a front-end query and reporting tool called DataDirect Explorer.

"Our virtual warehouse supports individual users and small teams well, but really doesn't scale up to the high end where you have hundreds of users involved in complex queries," Burns said.

Intersolv has been developing its own server-based middleware,

FileNet lays out integration plan for Watermark imaging technology

By Barb Cole

Costa Mesa, Calif.

FileNet Corp. last week will disclose plans to use imaging technology obtained through its acquisition of Watermark Software, Inc. to expand the reach of its document management and workflow software across the enterprise.

The plan includes developing a low-cost desktop image viewer

based on Watermark technology and adding workflow capabilities to Watermark document imaging software, said Jordon Libit, vice president of marketing at FileNet. FileNet will also integrate its document management server with Watermark's so users can move information between them, he added.

FileNet, which makes production workflow systems, acquired Watermark over the summer in a \$61 million stock deal (NW, July 24, page 25).

Libit said the new image viewer is targeted at existing FileNet customers who want to deploy document management and workflow across the enterprise but cannot do so easily or economically with FileNet's current suite. The product, due early next year, will cost about half as much as FileNet's existing \$595 viewer.

The company's plan to add a scaled-down edition of its work-

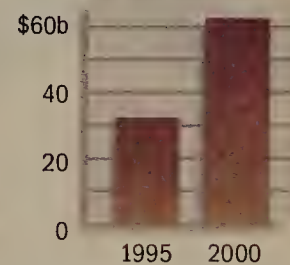
nology a performance boost," said Bob Moran, an analyst at Aberdeen Group, a market research firm in Boston. "This [acquisition] will also enable Intersolv to take its [data warehousing] tools higher up in the enterprise than they have been."

On the business side, the TechGnosis purchase gives Intersolv a larger installed base, particularly in the Pacific Rim, Moran said.

According to Intersolv officials, TechGnosis has more than 4,000 SequeLink customers worldwide.

©Intersolv: (301) 838-5000.

The electronic mail industry generated \$31.1 billion in revenue last year in the U.S. and Canada, according to a survey of more than 3,000 Electronic Messaging Association members and nonmembers conducted by Wilkofsky/Gruen & Associates. That number should balloon to \$61.3 billion by the year 2000, the survey found.



For more information about the EMA, point your web browser at <http://www.ema.org/ema/>.

Can FileNet hit this Watermark?

July 1995

FileNet acquires Watermark Software, a document management software provider.

Mid-1996

FileNet WorkFlo capabilities will be added to the Watermark document management system.

1995

1996

Early 1996

FileNet will ship a new release of its imaging client based on Watermark's technology.

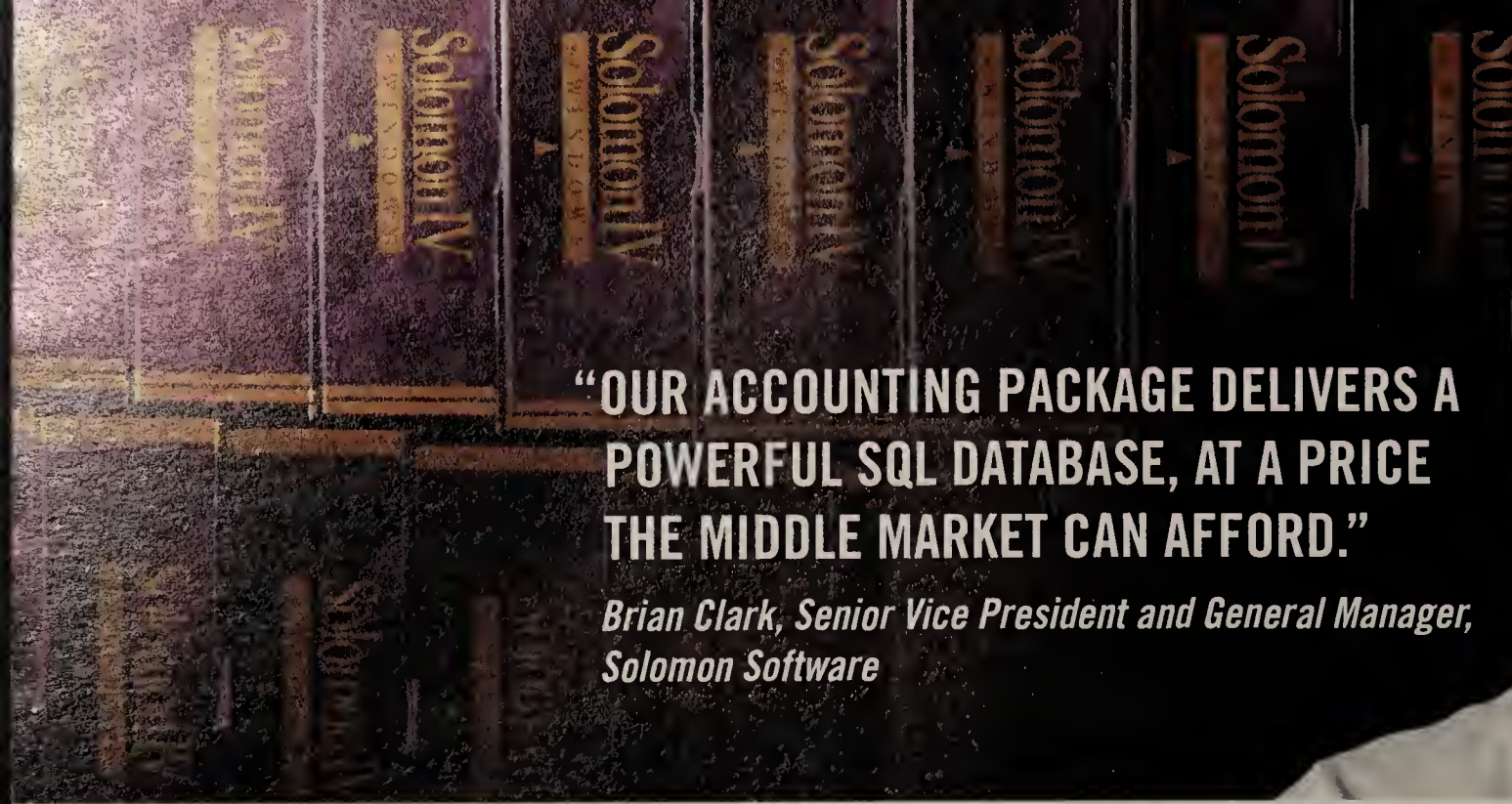
Late 1996

Image servers from FileNet and Watermark will be able to share information.

flow technology into the Watermark server designed to make it easier for customers to install and modify workflow software. The offering, aimed at departmental nets, is scheduled to be included in the next release of Watermark Enterprise Series around next April.

FileNet's work to let customers exchange documents between FileNet and Watermark systems, meanwhile, is geared toward enterprise net customers. The integration effort, set for completion by year-end, could be key to customers that have deployed large-scale File-

See FileNet, page 37



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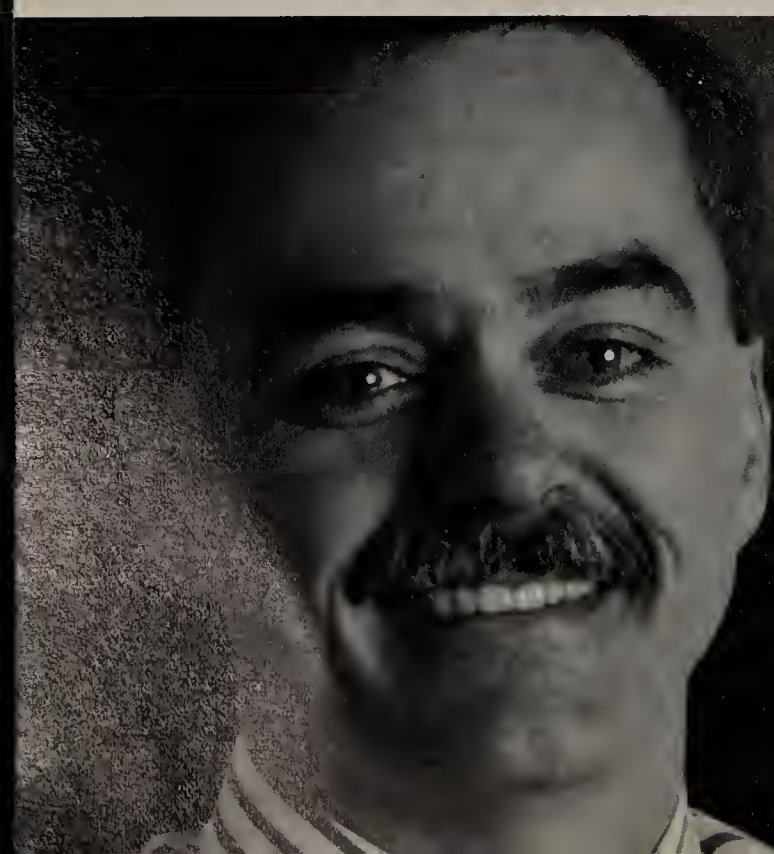
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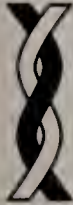
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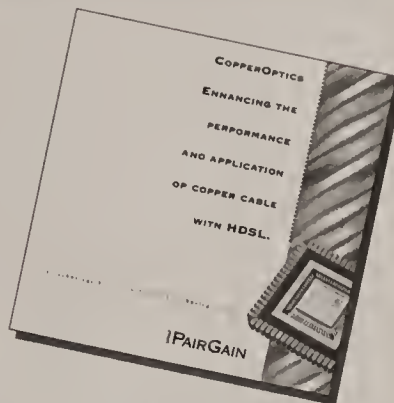
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TI composes new edition of apps development tool

Company's repository-based Composer 3 lets developers create distributed applications from component parts.

By John Cox

Texas Instruments, Inc. has announced a new version of its flagship distributed application development tool set, now targeted at letting developers build programs from ready-to-use components.

TI will formally unveil today Composer 3, a repository-based tool set for building large-scale distributed applications. The software now runs on developers' Windows 95 workstations as well as on Windows NT workstations as a 32-bit application. Previously, it ran on Unix, OS/2 and Windows 3.1 platforms, as well as on Windows NT workstations as a 16-bit application.

Applications designed with the tool can now be deployed on Windows 95 and HP-UX clients, whereas previously, they could only run on Windows NT, Windows 3.1 and OS/2 systems.

Other additions for the tool include support for TCP/IP, which enables Composer applications to communicate with mainframe ones.

A built-in version control manager

has also been introduced for the Composer repository running on Windows NT or Unix servers.

Previously, version control was available only on the mainframe repository.

TI's Composer product is a reinven-

tion for distributed computing of the company's mainframe computer-aided software engineering tool, known as Information Engineering Facility (IEF). Composer is aimed at companies developing software components that can be

reused in building large or small distributed applications.

According to Johnny Long, director of production technology for Texas Instrument Software, almost 45% of IEF customers have converted to Composer since the latter product was introduced a year ago.

Composer 3 pricing is unchanged from previous versions of the software, ranging from \$14,000 to \$24,000.

©TI: (800) 838-1843.

FileNet

Continued from page 35

Net workflow systems but do not necessarily want to give every user full access to them, Libit said.

Analysts said the plan will help FileNet boost its presence in the workflow and imaging arena. "FileNet does well at the

high end, but a lot of customers don't need all that horsepower," said Scott McCready, director of image systems at International Data Corp. in Framingham, Mass.

The FileNet

image viewer

will face stiff

competition

from Microsoft.

The FileNet image viewer will face stiff competition from Microsoft Corp., which plans to include a viewer for free in Windows 95 by year-end, McCready said.

According to users, the plan should help them deploy FileNet products on a wider scale. "We have a \$10 million installation of FileNet, but we were trying to figure out how to connect a Watermark client to a FileNet back end when the acquisition occurred," said Laura DelGaudio, technical architect at Bankers Trust Co. in New York.

The bank wants to give users the ability to view images without tying them into the FileNet workflow system, DelGaudio said. The integration plan will enable this with little work on the bank's part, she added. ■

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reengineering involving technologies

such as electronic imaging and workflow. Link

to <http://www.nwfusion.com>. From the main menu,

select News+ then Client/Server Applications.

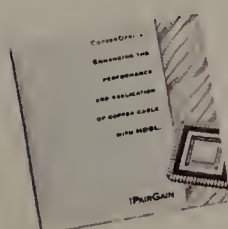
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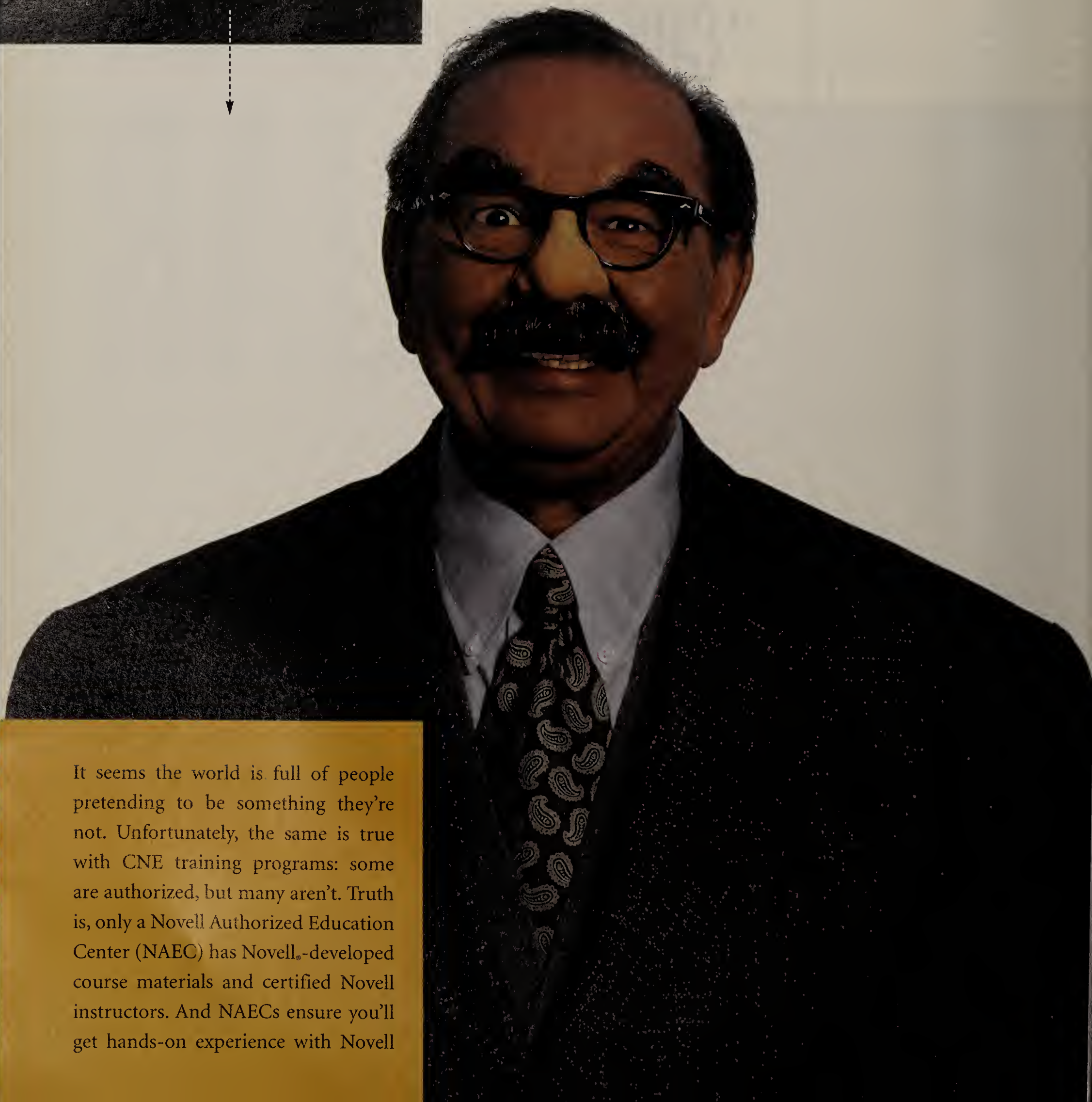


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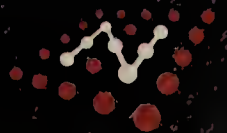
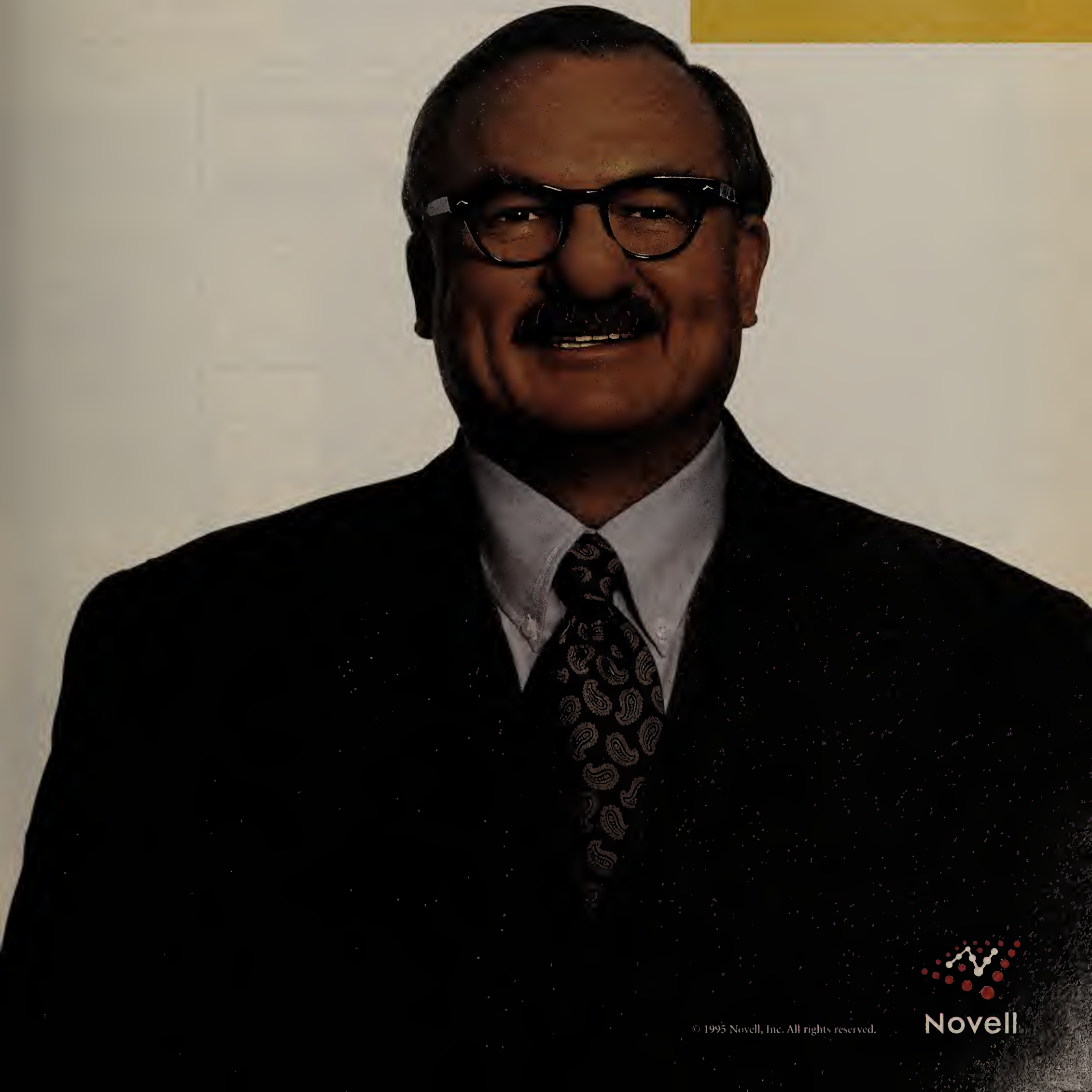
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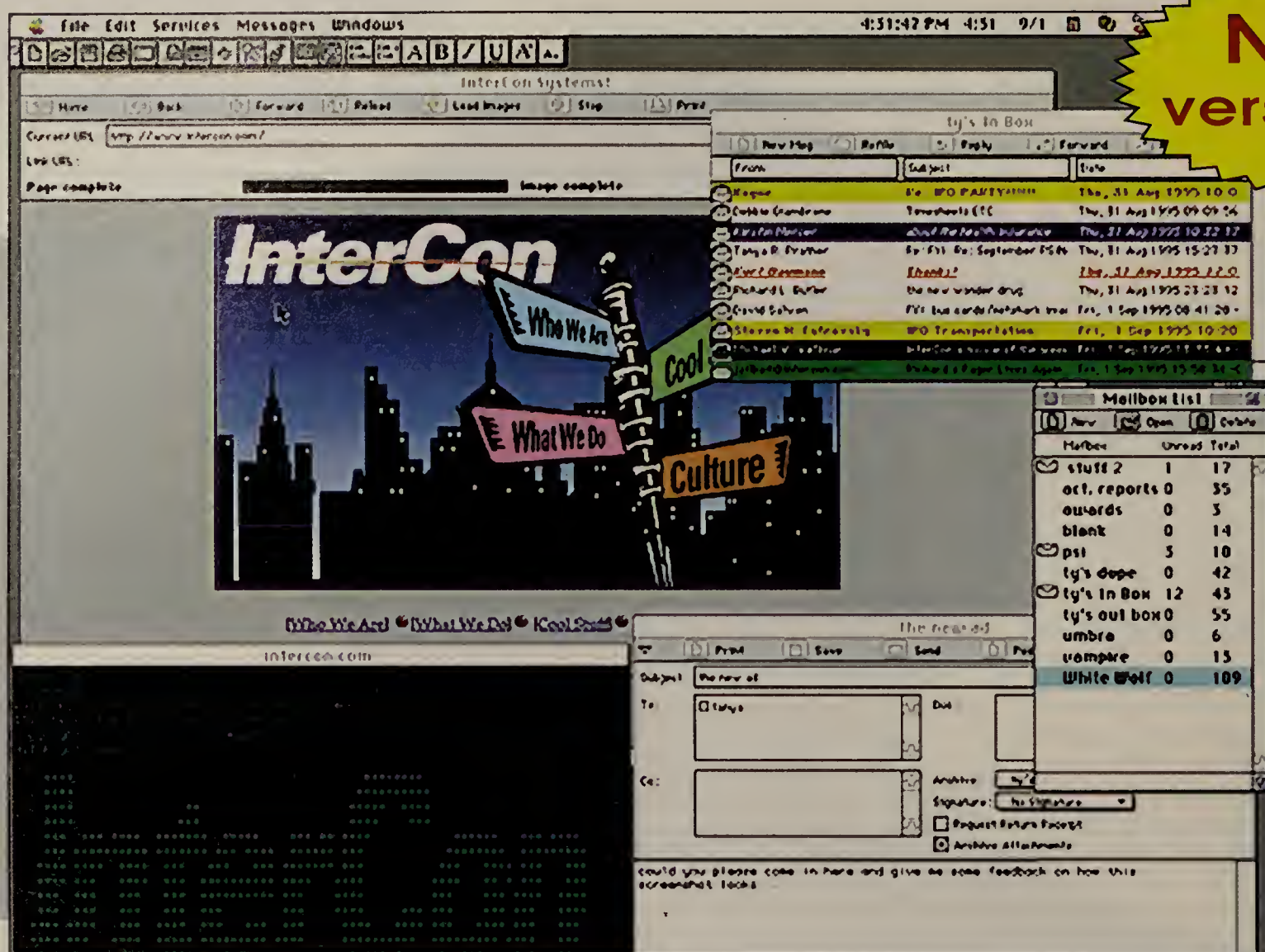
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SHARED LOGIC

It's time for road warriors to unite

In the wake of the Million Man March in my hometown of Washington, D.C., I thought it would be a good idea to start organizing a grassroots campaign of my own.

I'm not so worried about overriding political issues, but there are some injustices I perceive in our own little technology world that really need to be resolved. At the top of my list is that road warriors are being treated like second-class citizens.

Those of you who travel a lot know what I'm talking about. How many times have you gotten to a hotel in a random city only to find out your E-mail gateway is down, so all the work you did on the plane is for naught.

Ever try to dial in to a corporate database over a remote access link? Don't even think about it, unless you have a few hours to burn. The list of gripes goes on.

The frustrations I have with my inability to access my company's corporate systems has forced me to build redundant processes to log all my calls and meetings,

and, subsequently, have my assistant back in the office do the data entry. Isn't this what automation is supposed to avoid?

What many application developers don't seem to realize is that not every end user has

access all of the time to the plentiful, cheap bandwidth on a campus net. Yet, less than 5% of all applications developed appear to have been built with the untethered user in mind.

Even products like Lotus Development Corp.'s Notes, allegedly designed for the mobile user, are no panacea. Our Notes-based research database contains over 45M bytes of data.

Frankly, I have enough gray hair; I just can't afford to tie up my machine waiting the better part of an hour for the replication to finish.

So, of course, the answer must be higher bandwidth, since 14.4K bit/sec isn't enough. Here's a new 28.8K bit/sec modem. How about ISDN? Big problems demand big pipes, right?

More bandwidth becomes cost-prohibitive, especially to mobile professionals. And over the long term, it doesn't provide the level of customer service that end users, like me, rightfully expect.

In my view, a few short-term fixes can make applications perform a bit better in the eyes of mobile end users. First, using a remote control session to do local processing — usually behind a remote node access point — will help performance considerably.

An alternative approach is to try a product like Citrix System, Inc.'s WinView and WinFrame application server platform. I like Citrix's approach because you

get more efficient use of hardware resources compared to remote control solutions. A growing legion of top client/server application vendors — with PeopleSoft, Inc. being the latest — are working with Citrix to tune their software

for remote usage.

Yet, these are still Band-Aids for the real problem, which is a lack of cognizance about disconnected users at the design stage.

Developers need to take a look at tools, such as Xcellent, Inc.'s RemoteWare or even Notes, to build road warrior-friendly applications.

Life on the road isn't a bowl of cherries to begin with, but application developers

could do a lot more to make it more fruitful.

Rothman is a vice president in META Group, Inc.'s Global Networking Strategies service in Reston, Va. Feedback is welcome either by E-mail at miker@metagroup.com or by phone at (703) 860-6600. Rothman's column alternates in this space with that of Marc Myers, president of Client/Server Connection, Ltd.



Mike Rothman



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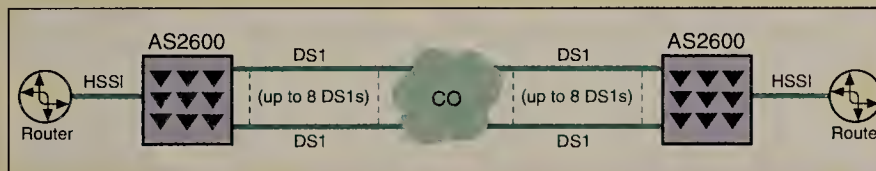
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Avoiding the dark side of data access

A new crop of client/server tools is helping to relieve pressure on network performance.

By Barb Cole

Decision-support tools might liberate end users from begging MIS to produce data warehouse reports for them, but that freedom can come at a price.

These graphical user interface-based client applications — which include everything from personal databases to packages that lump data in easy-to-understand business terms — have become popular in client/server environments because they let end users retrieve data from multiple databases without custom programming or SQL knowledge. But putting ad hoc query capabilities in the hands of large numbers of end users can present a challenge for network administrators.

"Network bandwidth is probably the No. 1 issue to successfully deploying decision-support applications," said Howard Dresner, research director at Gartner Group, Inc. in Stamford, Conn. "The dominant model for [queries and] reporting is still to have all the applica-

tion smarts residing on the desktop, so you're always pumping data over the network."

But early adopters who have deployed decision-support tools on a large scale said new tools are cropping up to ease the burden that constant queries put on a net. Also, users have begun rethinking the way they design their networks to better support heavy traffic loads generated by decision-support applications.

Tool time

Among the new tools being examined by firms experienced in managing decision-support applications is Information Advantage, Inc.'s DecisionSuite. It stores server-based intelligent agents that send updates in users' areas of interests to their PCs, a process designed to keep users from repeatedly dragging the same query results over the network.

Other users are seeking out tools that do the bulk of their query processing on the server, cutting down on the amount of

data traveling on the net between clients and servers.

"Whenever you have ad hoc queries, network bandwidth is an issue, but the key [to good performance] is that the software be designed for client/server," said Kerry Reed, application manager at Trunkline Gas, a division

of one GUI. He chose Cupertino, Calif.-based Business Objects, Inc.'s Business Objects to access data from Computer Associates International, Inc. OpenIngres databases running on a Digital Equipment Corp. VAX, DB2 data residing on a mainframe and information stored in a Windows NT-based Sybase, Inc. System 10 database.

Reed said the design of Business Objects' software helps ease the networking burden. "The

ing crop of decision-support tools, administrators are using multitiered architectures that divide the data retrieval work between clients and servers, and distribute data among several servers to achieve optimal network performance.

Watch the back end

While bandwidth and network-aware tools are key, database and hardware bottlenecks can also slow applications. "Ours was a [symmetric multiprocessing] issue. It was easy to tax the server to the point where nobody could get what they wanted," said Tim Lyons, IS manager at Nationwide Life Insurance Co. in Columbus, Ohio. "People would kick off large queries and dog the system."

The firm plans to move its Oracle Corp.-based decision-support applications to massively parallel processing systems or clusters of SMP machines. "We think that will give us the scalability and performance we need," Lyons said.

According to analysts, storing corporate data in LAN servers, as opposed to housing it in monolithic, centralized databases, can help avoid database bottlenecks and ease network strains.

The Los Angeles Times Co. in Los Angeles distributed its database to deliver better query performance to about 85 users who rely on the advertising information in stores. Users receive weekly extracts from the central-

Lessons from the decision-support trenches

- ▶ Stage data as close to end users as possible.
- ▶ Separate decision-support application users from production systems.
- ▶ Avoid gateways that offer direct connections to multiple databases.
- ▶ Make sure there is adequate bandwidth to handle the data requested by end users.
- ▶ Distribute data among servers to head off bandwidth bottlenecks.
- ▶ Preset the maximum amount of information that can be grabbed by an end user at a given time.
- ▶ Remember that software designed to run in a client/server environment will generally deliver the best performance in such an environment, so don't try to force other software to work in such situations.

of Houston-based gas company Panhandle Eastern Corp.

Three years ago, Reed set out to build a decision-support application to give about 300 users access to several databases via

tool can [do much of its query processing] on the database server. So instead of bringing back 8,000 records [in a table], it brings back just the eight you're looking for," he explained.

This is in contrast to file managers such as Borland International, Inc.'s Paradox and dBASE, which may ship an entire database table to an end user when all the person really wants is one record from that table.

Several decision-support tools also have features that let administrators limit the number of rows that can be returned to the end user or the amount of time spent running a query.

"We're doing a lot of work on the front end to make sure our decision-support application is network-friendly," said John Rome, assistant database administrator at

Arizona State University in Tempe, which has about 400 users accessing a data warehouse of financial and student data.

The university is utilizing features in Brio Software, Inc.'s Brio query tool that let Rome specify the maximum number of rows that a query may return. "We also try to train users to think about designing [intelligent] queries," he said.

In addition to taking advantage of features within the grow-

What's new in decision-support tools

Vendors are tackling many shortcomings of today's decision-support tools via a batch of new technologies that users can expect to see implemented in products during the next 12 months or so.

Tool vendors are looking to leverage new features being packed into relational databases, extend their client/server products to work in a three-tier architecture and focus on metadata.

In the short term, tool vendors are working more closely with database vendors, which are adding new indexing mechanisms and multidimensional capabilities to the basic relational database engine. "We're doing this to make sure the best of the database technology, in terms of performance and ease of access, is being delivered to the users on the desktop," said Katherine Glassey, executive vice president of products and marketing at Brio Technology, Inc. in Mountain View, Calif.

Tools are becoming more sophisticated, as well, in that vendors are designing their software to run various jobs — such as formatting query results and printing them — on a middle tier of low-cost servers that sit between back-end servers and front-end clients.

Jeff Boehm, product marketing manager for data access tool vendor Business Objects, Inc., said this approach facilitates the sharing of decision information. "There are a lot of cases when

many people want to look at the same result set," he said. By doing some of the processing on a mid-level server in a three-tier environment, the query is "run and formatted only once, instead of having all the end users run the same query."

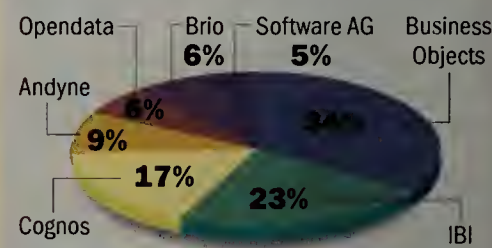
Other vendors are looking to make better use of metadata, which is information about the underlying, raw relational data. Typically, metadata lets users describe relational rows and columns in more easily understood business terms, such as "customer order." Brio has focused on enabling its tools to read metadata from a variety of data sources, while Business Objects' creates its own metadata by collecting metadata from other products.

Asymetrix Corp. in Bellevue, Wash., this week is releasing InfoAssistant, a decision-support tool set that can extract information from the data dictionary and create an English language model of the database. End users work with an English language browser to navigate through the database without having to know database structures and rules, according to Geoff Fitch, product manager with the company.

While these changes are good for companies looking to make data access more rewarding for employees, observers warned that they add complexity to the decision-support environment, as well.

John Cox

MANAGED QUERY TOOL MARKET SHARES



Based on total 1994 revenue of \$86 million.

GRAPHIC BY TERRI MITCHELL

SOURCE: META GROUP, STAMFORD, CONN.

ized database that are downloaded to their PCs, where they query the data with a tool from Cognos, Inc.

Users are able to query the information with little or no delay and do not impact the corporate network, according to Rich Thayer, advertising MIS manager at the LA Times.

"In general, the closer you can put data to the end user, the better off you will be," Gartner Group's Dresner said. ■



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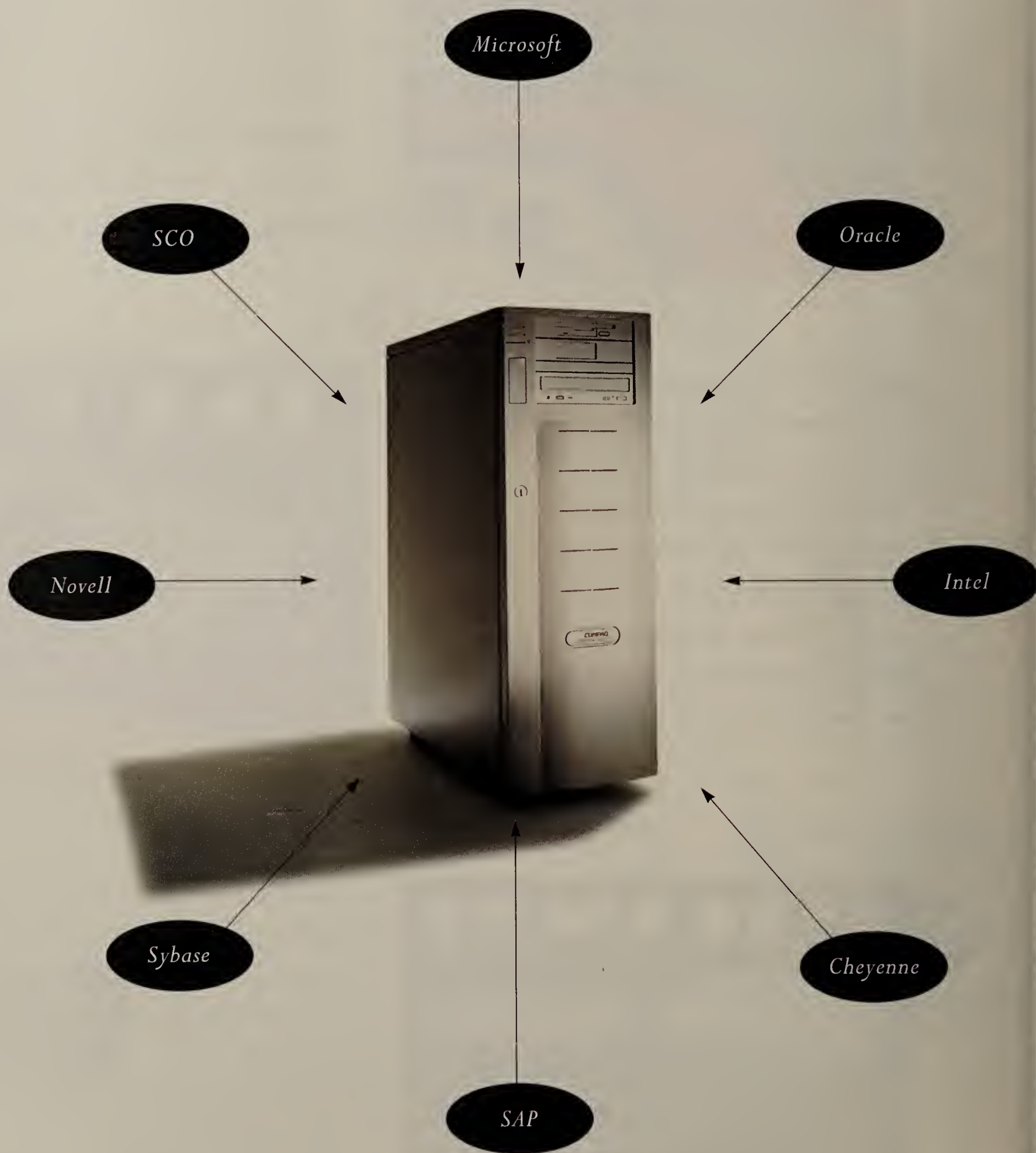
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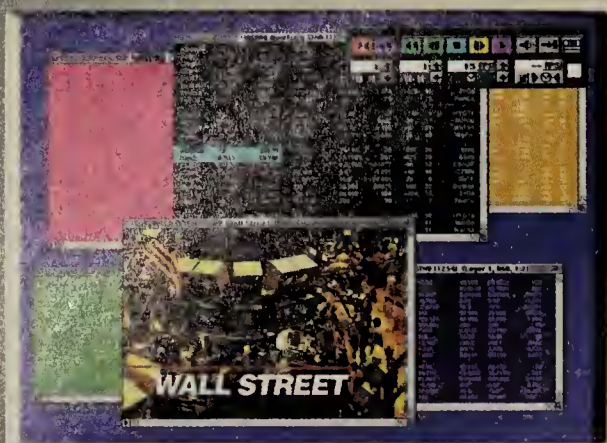
Any computer company can build hardware that runs software that runs your business. Or can it? After all, this is your business we're talking about here. Do you really want to trust it to mere hardware? At Compaq, we're betting you'd prefer an easy-to-use, fully thought-out solution. A solution that is the right combination of server, operating system, and database application that solves the puzzle of your varied computing needs.

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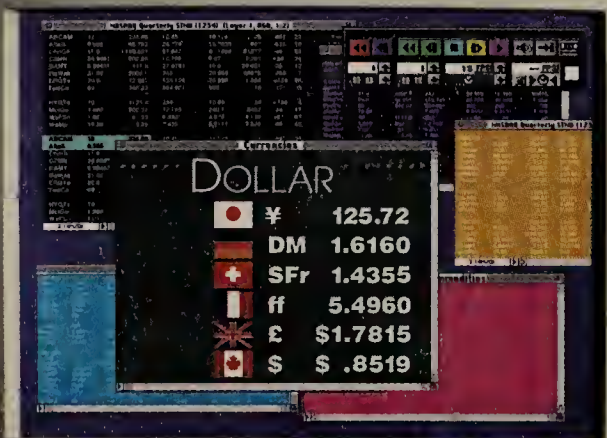
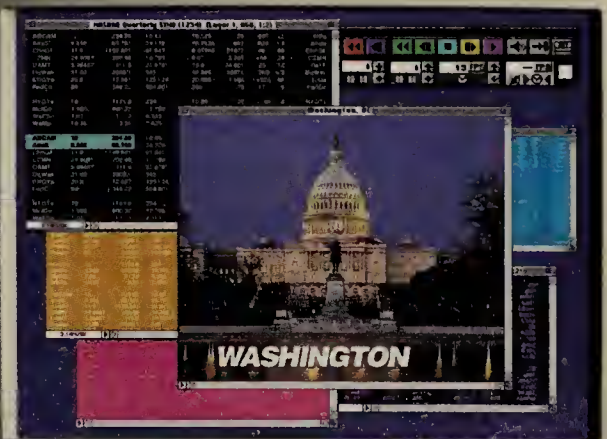
You see, they may be Compaq servers. But they are Compaq-Microsoft-Oracle-SAP-Intel-Novell-SCO-Sybase-Cheyenne solutions. (We just couldn't fit all those logos on them.)

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and Doing Business On-Line

Briefs

■ **Paris-based carmakers Peugeot and Citroen** selected IBM Global Network, Inc. to install a two-way very small aperture terminal **satellite network** to reach 4,200 independent auto dealers in 11 European countries.

■ **The Massachusetts Turnpike Authority** chose MFS Network Technologies, Inc. to install an \$11.8 million **electronic toll collection** system at the Boston Harbor Tunnels and on the Massachusetts Turnpike.

■ **Beyond 2000 Systems, Inc.** is shipping a \$9,995 **World-Wide Web server** package that consists of a 32-bit Pentium server bundled with Windows NT and Web server software preconfigured to create 20 HyperText Mark-up Language pages.

Beyond 2000: (800) 441-2282.

■ **Digital Equipment Corp.** next month will ship its Digital Internet Tunnel encryption security product. This lets remote users encrypt data between a desktop and server running the software, or from server to server for **bulk encryption**. The Digital Internet Tunnel server sits behind the firewall, where it encrypts TCP/IP data with the Data Encryption Standard and authenticates it using RSA Data Security, Inc.'s public key.

Digital: (800) 344-4825.

■ **AT&T and CNN Interactive** announced plans to deliver on-line and multimedia service via the AT&T Business Network, which will have hyperlinks to CNN Interactive's Web site.

■ **Process Software Corp.** announced it will integrate Verity, Inc.'s **search-and-retrieval** technology into its Purveyor World-Wide Web server software by early 1996. This will let standard Web browsers retrieve HyperText Mark-up Language pages using Verity procedures.

Defense Department launches EDI peace initiative

Plan suggests blending the U.S. X12 and international EDIFACT standards to avoid expensive conversions.

By Ellen Messmer
Long Beach, Calif.

In what could be called a world peace plan for electronic data interchange, the Department of Defense has proposed a plan to end the conflict between regional EDI standards.

The approach would blend the U.S. national ANSI X12 standard with the international EDI for Administration, Commerce and Transport (EDIFACT) standard in software so U.S. firms could avoid the expensive upgrade to EDIFACT. The plan last week was outlined in a Defense Department-sponsored study called "Electronic Data Interchange Implementation and Transition Roadmap."

Most firms on this side of the pond use software and services that support X12, while nations such as Japan and France rely on their own standards.

However, the United Nation's EDIFACT standard is viewed as the preferred standard for many

foreign governments and globally active corporations. But it has fewer transaction sets written for it than ANSI X12.

While the Defense Department wants to align its electronic commerce strategy with its NATO partners, which all use EDIFACT, it does not want to force domestic companies to buy expensive X12-to-EDIFACT conversion software in order to do business with the government.

For now, the Defense Department is supporting ANSI X12 in its domestic EDI purchases but plans to use EDIFACT on foreign military bases.

The creation of a uniform data dictionary that blends ANSI X12 and EDIFACT in software implementations could resolve the conflict, according to the Defense Department's Continuous Acquisition Lifecycle Support (CALS) Program Office.

"If we follow this approach, it should be possible to come up with a single EDI translator to be

MORE ON-LINE

Get documents related to the latest X12/EDIFACT alignment plan via Network World Fusion. Link to <http://www.nwfusion.com>. From the main menu, select **News+** then **Electronic Commerce**.



Government and industry officials meet in Washington, D.C. to discuss the EDI plan.

used for both ANSI X12 and EDIFACT," said CALS Director Elaine Litman. "This will let Defense and industry do business more economically and encourage migration to EDIFACT."

The CALS office, which defines common standards for sharing weapon systems design data with defense contractors, this spring had ManTech International, Inc. investigate ANSI X12 and EDIFACT to find similarities.

The study, which the Defense Department distributed at last week's CALS Expo here for feedback and debate, reveals that there is only about 45% commonality between the data definitions for EDIFACT and ANSI X12. Thus, it would be expensive and complicated to do conversions between the two standards.

The report recommends that "with a standard Electronic

Commerce Data Dictionary, low-cost SQL parsers could be made available to parse the data into appropriate message syntax."

Deanne Ervin, co-chair of the Federal Electronic Commerce Program Management office, said the report proposes a way to move to EDIFACT with dual support for ANSI X12. "You could create user-defined files that applications would use to go to either format," Ervin said. "But we'll have to change the EDIFACT message to use it."

"It's a tactical approach to the problem. It sounds like the search for a canonical middle format/middleware that will map into a native structure," said Steve Mahaney, SmithKline Beecham Corp.'s director of messaging. Mahaney said the business community wants to know more about the Defense Department's approach. ■

BUSINESS SPACE

Not a bad way to conference

It's time to fire up my crystal ball again. I'm writing this in a bar at a Club Med just outside of Nice, France, as I'm about to return to the U.S. Sounds way cool, doesn't it?

Well, lest you start to think I was leading a life of enjoyment and relaxation in the balmy atmosphere of Nice, let me tell you that:

■ I have a cold.

■ I have been at a conference and haven't even had time to go in the pool.

■ This must be the only Club Med that isn't near the sea.

The conference was Isocor's Partners Meeting.

If you don't know Isocor, its members are heavyweights in the X.400 and backbone messaging world — they can now do 1,000

mail transfers per second using a Sequent Computer Systems, Inc. machine.

I was invited there by Isocor's vice president of marketing, David Knight, to talk about the Internet and its future. One of the

topics I introduced was that we need to get rid of the Domain Name System (DNS).

DNS is OK, but it is starting to show its age. For example, as the Internet gets bigger, DNS' performance is slowly but surely getting worse. (Did you happen to notice

how often you received DNS lookup failures in the last few weeks that were cured by simply retrying?)

Plus, DNS is really not what we need.

If your company name is, for instance, Proctor & Gamble Co., why would you want to be called pandg.com?



Mark Gibbs

What we require is a real naming system.

While gibbs.com isn't too bad, I want to be known as Gibbs & Co. (On the other hand, the generic nature of gibbs.com means there's a small chance Gibbs International might make me an offer I can't refuse for my domain name. If you work for Gibbs International, please note that I can be contacted as detailed below.)

My guess is we'll see an explosion of X.500 on the Internet over the next few years (probably a very few years) that will coexist with, and ultimately oust, DNS. So don't worry if you can't get the killer domain name you'd like — within the next five years it won't matter much.

But now I've got to rush to catch a plane. With my luck, I'll have seen the movie.

Footnote: The movie was "While You Were Sleeping." I have now seen it three times. If I have to see it a fourth time, I may be forced to gnaw off my left leg.

By the time you get to read this, Mark Gibbs will be back in the office. You can make him an offer he can't refuse at mgibbs@gibbs.com, or call him at (800) 622-1108, Ext. 504.



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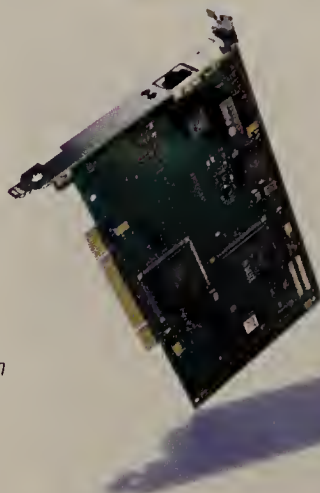
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¹ Lifetime warranty for as long as original purchaser owns adapter. IBM's Statement of Limited Warranty is available by calling 1 800 772-2227. Some configurations may not be compatible, check minimum system requirements. ² PCMCIA adapter available 12/95. ³ In Canada, call IBM's HelpFax, 1 800 465-3299 (ask for document #35131). IBM is a registered trademark and "There is a difference" is a trademark of International Business Machines Corp. ©1995 IBM Corporation.



Technology Update

Keeping Up with Network Technologies and Standards

NETWORK HELP DESK

Network World tracks down answers to your questions. Please submit them to Dana Thorat via phone at (800) 622-1108, the Internet at djt@world.std.com or fax at (508) 820-1103.

We're thinking of converting from NETBIOS Extended User Interface (NETBEUI) to TCP/IP and have TCP/IP on our Windows NT Servers. Can you provide information or refer me to a similar case study?
Via Network World Fusion.

The TCP/IP stack in Windows NT Server makes it simple to replace NETBEUI, says Bob Audlee, president of Realworld Network Consulting, Inc. in Leominster, Mass. Start by configuring a Windows NT Server as a Windows Internet Naming Service host.

A similar study is covered at <http://www.microsoft.com/services/technet/analpln/cs/sqnt779t.htm>.

For more detail, visit Network World Fusion at <http://www.nwfusion.com>. Select Forum from the main menu, then Help Desk and look for Conversion to TCP/IP.

I installed Windows 95 using NET-SETUP on a Novell, Inc. NetWare 3.11 server. But a NetWare 3.12 server refused to load OS2.NAM, which is used for long file name support. What should I do?
Via Network World Fusion.

Type LOAD OS2 at the NetWare prompt. Then type ADD NAME SPACE OS2 TO <volume—name>. Next, add the line LOAD OS2 to the STARTUP.NCF file using INSTALL.NLM. Lala Mamedov, a senior product support specialist at Stream International, Inc., a software reseller and support company in Norwood, Mass., says this should work. If it doesn't, verify the actual file OS2.NAM is in the same place as SERVER.EXE on the DOS partition.

If you still have a problem, it might be that the long file name is turned off by default on your NetWare 3.11 server. To enable it, get the file OS2NSFIX.EXE from Novell's World-Wide Web page at <http://www.novell.com> or on Novell's CompuServe forum. Run this utility and add the line SupportLFN=2 to the [nwredir] section of SYSTEM.INI on each node running NetWare Client.

The one, two, three of building virtual LANs

By Bob Olsen

Networking players agree the next generation of local backbones will rely heavily on switching and virtual LAN management, but they are at odds over how to create this environment.

VLANs are the broadcast domains of location-independent LANs. Broadcast frames emitted by an endstation are delivered only to other endstations that are members of the same VLAN. This ensures that nonmember endstations are not receiving irrelevant broadcasts.

Administrators populate VLANs with clients and servers that communicate with each other frequently. Routers interconnect VLANs and filter unnecessary broadcasts between them.

Switch vendors have three different strategies for configuring and managing VLANs. Each plan corresponds directly to one of the first three layers of the International Standards Organization's Open Systems Interconnection reference model. Some vendors view a VLAN as a group of LAN segments, others see it as a group of media access control (MAC)-layer addresses, and still others consider it a group of network-layer addresses.

Grouping by LAN segment

Net administrators create and maintain VLANs based on a group of LAN segments, each of which corresponds to a switch port. They simply gather port identifiers into named groups, typically via a VLAN management application that has a drag-and-drop graphical user interface.

All endstations on the LAN segments assigned to a VLAN are in the same broadcast domain and can directly communicate with one another. Routers are required for communication between endstations in different VLANs.

The primary advantage of segment-based VLANs is that vendors can implement them with relative ease and little expense. No intelligence is needed by the switch to inspect and forward individual endstation frames on the basis of MAC- or network-layer addresses. A broadcast that comes in a port simply goes out

to all other ports in the VLAN.

But this simplicity can be problematic for users and administrators. For example, users cannot freely move around the network because their VLANs are physically limited to just a subset of all available LAN segments. If users relocate to a LAN segment outside their VLAN, they will have to communicate back with the home server via a router.

What's more, manual intervention is required to set up and maintain each VLAN. This not only introduces a new administrative task, but, perhaps worse,

addresses, but many cannot. And some machines have MAC addresses printed on their LAN interface modules, but many do not. A network sniffer can acquire MAC addresses from incoming packets, but it cannot tell which user belongs to which MAC address.

The MAC address approach to VLANs is more flexible than the segment-based method for handling endstation moves, but VLANs populated by MAC addresses require considerable manual configuration.

In addition, MAC address VLANs cannot be dynamically

created by users, making it impractical to implement real-time multicast applications.

created by users, making it impractical to implement real-time multicast applications. Like in the MAC address scheme, endstations on different segments can be in the same VLAN and endstations in different VLANs can be on the same LAN segment. This ensures full freedom of user adds, moves and changes.

Automatic VLAN membership based on network-level attributes also supports IP Multi-

UP CLOSE Populating a virtual LAN

VLANs can be constructed and maintained in three ways, each of which corresponds to a layer of the Open Systems Interconnection reference model.

1 Layer 1 VLANs are based on groups of LAN segments, each of which corresponds to a switch port.

	VLAN1	VLAN2
1	•	
2		•
3		•
4	•	
5		•
6	•	
7	•	
8		•

2 Layer 2 VLANs are built using groups of media access control addresses.

VLAN1	VLAN2
020701A3EF1A	020701A3EF1A
0A032153EE04	0A0321A3EE04
0A032133DDD3	020701A3DDD3
020701A4043E	020701A4043E
0207018A16A2	
02070123A92B	

3 Layer 3 VLANs are created using groups of network addresses.

VLAN1
IP Subnet 198.3.104
VLAN2
IPX Network 5

creates by users, making it impractical to implement real-time multicast applications.

Grouping by MAC address

Configuring a VLAN with MAC addresses enhances a switched network's ability to deal with endstation moves. This scheme not only allows endstations on different LAN segments to be in the same VLAN, but also allows endstations in different VLANs to be on the same LAN segment.

When an endstation moves, its VLAN affiliation automatically goes with it because its 48-bit MAC address is still embedded in the computer's LAN interface.

But there is no consistent, practical way to acquire MAC addresses and associate them with specific user names, user groups, protocol types, subnetwork addresses and the like. Some endstations can display their MAC

Grouping by net address

To overcome any need to manually configure VLANs, some switches look at network-level attributes of traffic to automatically populate VLANs. Endstations using the same nonroutable protocol are placed in a VLAN — one VLAN for Local Area Transport, one for NETBEUI, for example.

Endstations using routable protocols are assigned to VLANs based on type and subnetwork number — one VLAN for IP Subnet 4, another for IP Subnet 5, a third for IPX Network 9 and so on.

The switches automatically create VLANs by examining all broadcast and multicast frames. Every endstation, regardless of protocol, issues broadcasts to request information or announce its presence. The con-

cast, an increasingly popular addition to the TCP/IP protocol suite. IP Multicast distributes copies of the same traffic to multiple endstations via LAN multicast addresses.

Protocol-aware VLANs also permit greater configuration control of a switch-based network. Net administrators can restrict protocols and network addresses to specific LAN segments and use Simple Network Management Protocol-based management applications to acquire and display the global view of the Layer 1, 2 and 3 structures of a backbone network.

To get what they need from a VLAN environment, net administrators should understand these schemes and know which technique their LAN switches use.

Olsen is vice president of marketing at Agile Networks, Inc., a Boxborough, Mass., manufacturer of Ethernet and ATM switches.

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EDITORIAL INSIGHTS

The back-burner blues

OK, frame relay is rolling along quite nicely when the regulatory monster raises its ugly head and bites customers.

Buyers are snapping up the service, often as part of a neatly bundled package that includes hardware, when the Federal Communications Commission rules frame relay is a basic service and has to be tariffed. The ruling raises the prospect of price hikes, throws into doubt the validity of current contracts and muddies the waters of bundling, which simplifies the buying process.

Now you're expecting me to blast the FCC, right? I can't, because the agency is correct. AT&T's arguments and customer concerns aside, frame relay is a basic service and should be tariffed.

And the truth is that even the FCC didn't want this decision. Chairman Reed Hundt has expressed a desire to do away with tariffing for many services, and this ruling must rankle the pro-competition FCC. But the agency has no choice. It has to follow the letter of the law — the Communications Act of 1934 — until Congress changes it.

And there's the rub: The telecommunications reform effort is stalled once again. With other issues jostling for Congress's and the White House's attention, telecom reform has moved to its accustomed spot: the back burner. A committee is ironing out differences between House and Senate versions of a reform bill, but don't expect action this session. And don't expect greater urgency in 1996 — a presidential election year.

Customers like you keep bearing the brunt of Congress' inability to finish telecom reform. Whether it's topsy-turvy rulings on contract tariffs or services like frame relay, buyers are continually subject to the vagaries of the regulatory process.

Hard-fought deals can be altered at the stroke of a pen — something that doesn't happen in any other sector of the network industry. Imagine your deal to buy 100 Cisco routers was turned on its head by a government agency. You'd be outraged. Yet network services buyers are accustomed to such nonsense.

Rather than engage in fruitless budget brinksmanship, the Republican leadership should boldly go where no Democratic Congress has gone before — to pass a reform bill. You can speed the trip by letting your legislators know you're tired of waiting.

John Gallant, editor in chief jgallant@nww.com



Opinions

THE BLUE VIEW

IBM pulls a switch on token ring that puts it in mixed company

In an attempt to address the burgeoning market demand for token-ring switching and frame relay, IBM recently decided to resell third-party products instead of its own (NW, Sept. 25, page 6). The tactical shift raises a red flag as to the role IBM is creating for itself in networking. For the next two years, both token-ring switching and frame relay encapsulation using the RFC 1490 encapsulation technique for supporting multiprotocol traffic will dominate IBM networking.

Much to IBM's chagrin — given the potential impact on its business plans — Asynchronous Transfer Mode will take a backseat to these two technologies.

Though not in the same mega-league as ATM, both token-ring switching and frame relay provide additional bandwidth. They also have the indubitable virtues of being cost-compelling, nearly non-disruptive and very low risk.

Within the IBM world, token-ring switching will ultimately be the campus bandwidth-enhancing precursor to ATM. Token-ring switching, not ATM, will thus provide this community with its first real taste of contemporary switching technology. On the other hand, frame relay will provide mid-band WAN bandwidth (up to 2M bit/sec) and the framework to realize multiprotocol networking across the WAN.

For token-ring switching, IBM, at least as a stop-gap measure, is now reselling the market-leading Centillion 100 switch from Centillion Networks, Inc. (a unit of Bay Networks, Inc.) in place of IBM's own ill-fated 8272 switch.

The 8272, preannounced more than a year ago, now has an uncanny parallel with the infamous IBM 6611 bridge/router, also unexpectedly delayed at the last minute after being preannounced over a year in advance.

On the frame relay side, IBM has struck a joint-marketing agreement with another market leader — this time Sync Research, Inc. Given that IBM does have other frame relay solutions, including the 2210 bridge/router based on Proteon, Inc. software, the Sync Research agreement can be rationalized as an exercise in product-line enhancement.

The Bay Networks deal, however, is not that easy to justify. The problem is the Centillion switch is essentially the antithesis of the 8272. With the 8272 announcement, IBM introduced the exciting notion of cut-through mode frame switching to the token-ring world. Although cut-through was the norm with Ethernet switching, none of the early token-ring switches supported it.

With cut-through, a switch starts forwarding the bits that make up a frame as soon as it has determined what the destination port should be. It does this by reading the Layer-2 destination address at the start of every token-ring frame. Cut-through potentially reduces the time a switch takes to deliver a complete packet from one port to another. Due to cut-through's on-the-fly bit-for-



Anura Guruge

warding, all the bits in a frame will have arrived at the destination shortly after the final bit was received at the source port.

Though offering cut-through, the 8272 does not support source route bridging (SRB), even though all the other token-ring pioneers, such as Standard Microsystems Corp., Bay Networks and Nashoba Networks, Inc. sup-

ported and promoted SRB. Initially, IBM suggested external SRB bridges be used with the 8272, although it later promised to provide SRB in 1996.

The Centillion switch that IBM is now reselling in place of the 8272 does not have cut-through but does support SRB, an about-face for IBM and token-ring switching.

To be fair, it's worth noting that neither cut-through nor SRB is imperative for token-ring switching. Not having SRB precludes the availability of redundant paths within the network and the possibility of using duplicate media access control addresses on separate LAN segments. It also prevents assignment of ring numbers — a technique often used, but not essential, for network management. Using external bridges also works.

Cut-through's higher speed also does not mean that it is always more desirable. For a start, there is always a danger that erroneous frames may be forwarded — wasting bandwidth on the output port and LAN. In addition, the throughput gains that cut-through makes possible are dependent on congestion and the nature of the traffic being forwarded.

If the output port required to forward a packet is busy either receiving or forwarding another packet, cut-through mode cannot work. In that case it essentially reverts to a store-and-forward mode.

Although the presence or absence of cut-through and SRB may disrupt many of your well-laid plans, it is not the real issue with the Centillion deal.

The crux of the matter is that IBM's Switched Virtual Networking must have multivendor interoperability now that IBM has introduced a non-IBM switch into its family. Before striking a deal with Bay Networks, IBM was beholden only to its two largest competitors for the bulk of its strategic campus-level products. It is now beholden to its three largest competitors. And last but not most disturbing, this trend highlights IBM's current inability to deliver competitive and compelling networking products on time.

Those of you who are IBM customers have no other option but to look at other solutions and think of IBM as simply another vendor alongside Cisco Systems, Inc., Bay Networks, 3Com Corp., and Cabletron Systems, Inc.

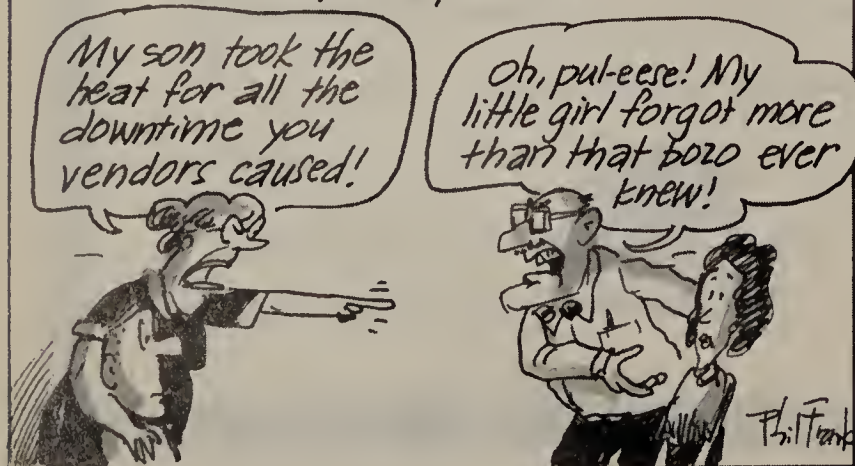
Guruge is an independent consultant specializing in internetworking and IBM network architectures. He can be reached at (603) 878-1303 or via the Internet at aguruge@mcimail.com.

Teletoons

By Phil Frank and Joe Troise
guru@well.com

The Future of Networking September, 1997

The Alpha testing (internal staff) and Beta testing (selected users) of new networking equipment is supplemented by adding "Gamma Testing" which includes everyone's parents:





Beware the telecom answer man

Christopher Finn

After spending a week at Telecom 95 in Geneva, I am sure of three things: The amount of money spent by the conference exhibitors and attendees could fund United Nations operations in Bosnia until the onset of true peace; telecommunications has become the most important single element of networking and networked computing; and no one really knows what the world of telecom will look like when Telecom 99 rolls around.

To start, the booths were like nothing ever seen at a network industry trade show in the U.S. If you think Interop is big, think again. How many Interop booths have elevators on the show floor to take you up to VIP areas where you can feast on a buffet of smoked salmon and champagne? At Telecom 95, that was the bare minimum for a major carrier or equipment vendor.

Such extravagant surroundings induce extravagant thinking. For example, I was fortunate enough to hear noted author and futurist George Gilder's views on the future of telecommunications. He talked of networks with "free" bandwidth and ubiquitous access as never before imagined.

He asserts that Moore's Law of exponential advances of processor speed pales compared to the explosion of bandwidth he predicts will soon be available in the wide area, thus prompting the information industry to focus on the pivotal role telecom plays in networking.

It seems to me that Gilder's remarks certainly ring true in the sense that local-area networking expertise will soon become a commodity. A few years ago, technicians who understood NetWare could wear shorts and Birkenstocks to work. Today, they are likely to be scrambling to avoid staff cutbacks or are sitting in ATM seminars. Ethernet has become like electricity — just one more plug on the wall.

That said, it is easy to conclude that "free" bandwidth will make the wide area look a lot like the local network — the WAN will quickly become a thing taken for granted.

However, these views don't jibe with the fact that transport is a

12-figure industry. Carriers are not about to start devaluing the service they provide. As network costs drop in relation to bandwidth, you can be sure that the costs related to supporting that transmission will drive the cost of the wide-area service.

We are already seeing it — network costs account for less than half the cost of a voice call. The rest goes to billing, customer service and to cover sales costs. As such, we may see some dramatic changes in how carriers price services, but don't count on telecommunications costs to decrease overall.

In an article in the *International Herald Tribune*, an International Telecommunication Union (ITU) official says, in effect, that carriers may move to fixed charges for access with no usage charges for voice and data.

He does not suggest that this will radically bring down overall costs but that factors point to this as a more efficient system. Try telling that to those RBOCs that have just spent \$400 million for systems to bill for usage and/or transactions.

Hence my third point, which is that no one really knows where this is all going. Carrier and ITU officials, as well as some consultants, may feel they have a crystal ball or that they can control the direction of telecom. However, there is now no single organization or alliance that can dictate, or even predict with certainty, the shape of things to come. If people tell you they have the answers, regard them as you would the naked man who offers you his shirt.

Still think you know? All right, raise your hand if you knew at Telecom 91 that the Internet would become the single most dominant force in telecom, or that the talk of global carrier alliances would bear virtually no fruit for four years.

Hmm. I thought so.

Finn is a senior consultant with TeleChoice, Inc., a Verona, N.J., consultancy specializing in strategic planning and analysis of intelligent networks, services and applications. He can be reached at (804) 288-6864 or via the Internet at chris_finn@mail.telechoice.com.



IN-BOX

Geographic domain names

I'm writing about Scott Bradner's recent column on geographic domain names on the Internet (Oct. 2, page 22).

Geographic domain names have a place in the world, but they are not a substitute for functional classifications like .com. IBM is a worldwide company; even its divisions have operations in multiple countries. It would be ridiculous to force IBM to use multiple domains and silly to tie any of them to a specific country. Ibm.com.us would not be descriptive.

As for smaller outfits like my own company, the option of a name like compata.costamesa.ca.us is available. But if we relocate to another city, we should not have to change our domain. Small companies

hope to get bigger, and one of the consequences of getting bigger is that they move. A constant domain name is one of the advantages the Internet has over the current telephone network (except for 800 and 500 numbers).

Geographic names are appropriate for entities that, by their very nature, will never move, such as government agencies.

*David Close
Principal consultant
Compata
Costa Mesa, Calif.*

AT&T column mistaken

In her column about the breakup of AT&T (Sept. 25, page 72), Mary Johnston Turner states that "The push toward product commoditization dictates low-cost manufacturing, sales and distribution models for hardware and software." That is mistaken, especially with regard to AT&T.

NCR Corp. was a sound PC marketer before AT&T paid top dollar for it. But the result of the acquisition was the creation of AT&T's Global Information Solutions, which has now gone away.

AT&T has failed in trying to market computers such as PCs.

AT&T has also failed just as badly in the software area. AT&T sold Unix to Novell for about \$360 million.

Now Novell wisely has unloaded Unix to The Santa Cruz Operation, Inc. for about half that price. In a wise move, AT&T divorced itself of Unix. But what is Unix without the C language? AT&T still has interest in C++ but has again failed in the software business because C++ has not delivered on its promise as the panacea for object-oriented technology.

The point is that Turner's notion about commoditization makes no sense when a company is selling off divisions as an act of final despair.

*Colin James III
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The author responds: My comments about commoditization were directed at the consumer and business telephony equipment businesses such as Paradyne Corp., which will be incorporated into the yet-to-be-named equipment/product house. My conclusions apply to such devices as phones, private branch exchanges, modems and data service units, which are widely recognized as commodities and are increasingly sold via low-cost channels.

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IT?

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LAN access worlds CONVERGE

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communities
find common
ground.

Buyer's Guide

By Tony Croes

A fundamental shift is under way in the remote LAN access market as the influence of the Internet manifests itself in products that support traditional TCP/IP-related protocols but also take advantage of the security and administrative features that corporate customers demand.

With more roving workers requiring dial-up access to both the Internet and corporate LANs, vendors catering to the traditional business world have rapidly adopted the Internet-based SLIP and PPP over proprietary technology as their remote node protocols of choice. At the same time, vendors whose roots are in the Internet community are picking up on the robust administrative and security features that are the cornerstone of network operating systems (NOS) used on corporate LANs.

Meanwhile, a number of third-party vendors without allegiance to either camp are producing software that will tie remote nodes to a mix of different vendors' LAN access servers.

What this means is that the protocol wars are over; you can now make a selection based on which remote LAN access unit has the configuration options, port densities, security, authentication services and management tools that best suit your needs.

Products in this market come in three different flavors: hardware, software and dial-up bridge/routers. The hardware products include everything from large chassis-based or modular units to fixed-port network modems.

The chassis-based hardware includes expandable racks for mounting LAN and WAN interface boards, modems and even board-based PCs. Those boards are interconnected by a specialized bus. Modular units include a limited number of slots for LAN and WAN interface boards that plug into a backplane.

Vendors such as Andrew Corp., CommVision Corp., U.S. Robotics and Xylogics, Inc. have high-end products in this category that support 96 or more asynchronous ports.

Software-based products from Novell, Inc., Cylink Corp. and IBM support a similar num-

ber of ports when running on the right server hardware and using the LAN and WAN interfaces installed in that server.

Mid-range products — including stand-alone devices from 3Com Corp., Digi International, Inc., Digital Equipment Corp., Evergreen Systems, Inc., Microcom, Inc., Shiva Corp. and Xyplex, Inc. — are modular offerings that support anywhere from 16 to 64 ports. Ditto for software-based offerings from the likes of Attachmate Corp., Citrix Systems, Inc. and Funk Software, Inc.

Lower end workgroup products and network modems from a variety of vendors support a fixed numbers of ports, often topping out at eight.

The type of product you evaluate depends on whether you want each port on the central access device to support a single node at a time or multiple remote nodes simultaneously. Alternatively, you might prefer to have a dial-up router connect to a central-site LAN on an as-needed basis.

Continued on page 60

Remote LAN access

Company	Product	Type	Max. no. of ports	NOS					WAN interfaces				Dial-up protocol	Protocols routed				Features		Security						Mgmt. agents				Price
				L = LAN W = WAN	AppleTalk	LAN Server	NetWare	Windows NT Server	Other	Analog dial-up	Frame relay	Fractional T-1/T-1		ISDN BRI	AppleTalk	IPX	TCP/IP	VINES IP	Max. number of LAN sessions	Data compression ratio	CHAP	Dial-back	Encryption	PAP	RADIUS	Other	Proprietary	SNMPv1	SNMPv2	
Microcom, Inc. (800) 822-8224	LANexpress 3.0	Dial-up bridge/router	L: 1 W: 12	✓	✓	✓	✓	✓	✓				ARAP, PPP, other		✓	✓	12	4:1	✓	✓	✓	✓			✓					\$3,499-\$11,899
Motorola Information Systems Group (800) 487-1456	Vanguard 300	Dial-up bridge/router	L: 1 W: 3						✓	✓		✓	PPP	✓	✓	✓	500+	9:1					✓	✓	✓		✓			\$1,299-\$2,199
	Vanguard 305	Dial-up bridge/router	L: 1 W: 3					✓	✓	✓		✓	PPP	✓	✓	✓	500+	9:1					✓	✓	✓		✓			\$1,799-\$2,699
Multi-Tech Systems, Inc. (800) 328-9717	MultiCom Async Gateway	Hardware	L: 1 W: 32		✓	✓	✓		✓			✓	Serial		✓	✓	32	4:1		✓	✓				✓					\$399-\$3,896
	MultiCom Remote Node Gateway	Hardware	L: 1 W: 32			✓			✓				Serial		✓	✓	32	4:1		✓		✓			✓					\$799-\$3,896
Network Express, Inc. (800) 553-4333	InterHub	Hardware	L: 2 W: 24	✓		✓	✓		✓	✓	✓	✓	PPP			✓	48	4:1	✓		✓	✓	✓	✓	✓	✓	✓		✓	\$5,900-\$27,500
	NELink 1000	Dial-up bridge/router	L: 1 W: 4	✓		✓	✓					✓	PPP			✓	8	4:1	✓		✓	✓	✓		✓	✓		✓		\$1,995-\$4,995
Network-1 Software and Technology, Inc. (800) 638-9751	Net1-AccessPlus	Hardware	L: 6 W: 250+						✓				PPP, SLIP		✓	✓	150						✓	✓				✓		\$22,620-\$25,981
Novell, Inc. (800) 638-9273	NetWare Connect 2.0	Software	(3)	✓		✓			✓			✓	ARAP, PPP, SLIP, other	✓	✓	✓	128		✓	✓		✓					✓			\$495-\$23,980
Penril Datability Networks (800) 473-6745	LinkUp family	Dial-up bridge/router	L: 1 W: 24						✓				PPP, SLIP, other		✓	✓	24	6:1	✓	✓		✓			✓		✓			\$1,899-\$18,795
Racal-Datcom, Inc. (800) 722-2555	Excalibur Remote Access Server	Hardware	L: 1 W: 8	✓	✓	✓	✓	✓	✓		✓		ARAP, PPP, SLIP	✓	✓	✓	✓	8	4:1+	✓	✓		✓		✓	✓	✓		✓	\$2,995
RAD Data Communications, Inc. (201) 529-1100	Ethernet Bridges MBE 10 family	Dial-up bridge/router	L: 8 W: 2		✓	✓		✓	✓	✓	✓	✓	PPP, SLIP		✓	✓	250		✓	✓	✓	✓			✓	✓	✓	✓		\$1,100-\$1,450
	Ethernet Multiport Asyn/Sync Remote Access Server MBE-RAS family	Hardware	L: 1 W: 8		✓	✓		✓	✓	✓	✓	✓	PPP, SLIP		✓	✓	✓	250		✓	✓	✓	✓			✓	✓	✓	✓	\$2,400-\$2,995
	Modular Intelligent Hub RADring	Hardware	L: 80 W: 18		✓	✓		✓	✓	✓	✓	✓	PPP, SLIP		✓	✓	✓	250		✓	✓	✓	✓			✓	✓	✓	✓	\$900-\$4,925+
	Token Ring Bridges TRE-16 family	Dial-up bridge/router	L: 8 W: 2		✓	✓		✓	✓	✓	✓	✓	PPP, SLIP		✓	✓	✓	250		✓	✓	✓	✓			✓	✓	✓	✓	\$1,450-\$1,950
	Token Ring Multiport Asyn/Sync Remote Access Server TRE-RAS family	Hardware	L: 1 W: 8		✓	✓		✓	✓	✓	✓	✓	PPP, SLIP		✓	✓	✓	250		✓	✓	✓	✓			✓	✓	✓	✓	\$2,800-\$3,995
Rockwell Network Systems (800) 262-8023	NetHopper family	Dial-up bridge/router	L: 1 W: 5			✓		✓	✓		✓	✓	PPP, other		✓	✓	5	4:1	✓	✓		✓	✓	✓		✓				\$1,495-\$3,995
SFA DataComm, Inc. (800) 270-2669	SFA/SpreadNet	Spread-spectrum bridge	L: 1 W: 3	✓	✓	✓	✓		✓	✓						✓	256				✓				✓					\$6,120-\$12,240+
	XenoLink Integrated Access Node	Dial-up bridge/router	L: 5 W: 1			✓			✓	✓	✓		SLIP		✓	✓	No limit	2:1		✓		✓			✓	✓	✓			\$2,800+
Shiva Corp. (508) 788-3061	LANRover and LANRover/Plus 3.5	Hardware	L: 1 W: 8	✓	✓	✓	✓		✓		✓	✓	ARAP, PPP, SLIP, other	✓	✓	✓	8	4:1	✓	✓		✓			✓	✓	✓	✓		\$3,099-\$9,999
	NetModem/E 28.8	Hardware	L: 1 W: 1	✓	✓	✓	✓		✓				ARAP, PPP, SLIP, other	✓	✓	✓	1	4:1	✓	✓		✓			✓	✓	✓	✓		\$1,999
Symplex Communications Corp. (313) 995-1555	DirectRoute family	Dial-up bridge/router	L: 2 W: 6	✓	✓	✓	✓				✓	✓	PPP		✓	✓	No limit	8:1	✓		✓	✓			✓	✓	✓	✓		\$1,299-\$3,799
Telebit Corp. (800) 835-3248	NetBlazer	Hardware	L: 3 W: 34	✓		✓		✓	✓	✓			ARAP, PPP, SLIP, other	✓	✓	✓	34	4:1	✓	✓	✓	✓				✓		✓		\$899-\$12,748
Telematics International, Inc. (800) 833-4580	ACP family	Dial-up bridge/router	L: 1 W: 50					✓	✓	✓		✓	PPP, SLIP, other			✓	No limit	4:1	✓	✓		✓	✓		✓					\$2,000-\$4,230
3Com Corp. (800) 638-3266	AccessBuilder family	Hardware	L: 1 W: 16	✓	✓	✓	✓	✓	✓			✓	ARAP, PPP, SLIP, other	✓	✓	✓	✓	10	Varies	✓	✓		✓		✓		✓		✓	\$2,495-\$10,485
Tribe Computer Works (800) 778-7423	TribeLink family	Hardware	L: 1 W: 8	✓		✓	✓		✓			✓	PPP			✓	1		✓			✓	✓		✓					\$1,295-\$1,995
UB Networks, Inc. (800) 777-4526	Access/Remote	Dial-up bridge/router	L: 8 W: 1								✓	✓	PPP	✓	✓	✓		4:1								✓		✓		\$2,795-\$3,395
U.S. Robotics (800) 877-2677	ISDN BRI and PRI Adapter	Hardware	L: 1 W: 23			✓	✓					✓	PPP	✓	✓	✓	23	4:1	✓	✓		✓				✓				\$649-\$2,900
	Total Control Enterprise Network Hub w/ NetServer	Hardware	L: 6 W: 256		✓	✓	✓	✓	✓	✓	✓	✓	PPP, SLIP, other		✓	✓	256	4:1	✓	✓		✓	✓		✓	✓		✓		\$20,000-\$80,000
	Total Control NetServer/8 and NetServer/16	Hardware	L: 1 W: 16		✓	✓	✓	✓	✓			✓	PPP, SLIP		✓	✓	16	4:1	✓	✓		✓	✓		✓	✓		✓		\$7,995-\$16,995
Webster Computer Corp. (800) 457-0903	MultiPort/LT	Hardware	L: 5 W: 4	✓					✓				ARAP	✓		✓	4			✓					✓	✓		✓		\$1,995
Xircom, Inc. (800) 438-4526	Netaccess MultiPort Modem Card	Hardware	L: 0 W: 8			✓	✓		✓				PPP, SLIP				8	4:1	✓	✓		✓				✓				\$2,299-\$3,999
Xylogics, Inc. (800) 225-3317	Nautica family	Dial-up bridge/router	L: 1 W: 4			✓	✓	✓			✓	✓	PPP, other		✓	✓	3,000	4:1	✓		✓	✓		✓		✓		✓		\$1,195-\$4,295
	Remote Annex 2000 and 4000	Hardware	L: 1 W: 72	✓		✓		✓	✓				ARAP, PPP, SLIP	✓	✓	✓	72		✓	✓	✓	✓			✓		✓			\$2,695-\$13,085
	Remote Annex 6100	Hardware	L: 1 W: 1	✓		✓		✓			✓		ARAP, PPP, SLIP	✓	✓	✓	24		✓	✓	✓	✓		✓		✓		✓		\$16,995-\$29,995
Xyplex, Inc. (800) 338-5316	MaxServer 1600 Remote Access Server family	Hardware	L: 1 W: 40			✓	✓	✓	✓				ARAP, PPP, SLIP, other		✓	✓	255	2:1	✓	✓		✓	✓	✓		✓		✓		\$1,995-\$5,995

Products highlighted by color were selected for The Short List.

Chart compiled by Kathy Scott

Footnotes:

- (1) Limited by memory.
- (2) Supports 15 users per Pentium CPU and symmetric multiprocessing.
- (3) Depends on server hardware.
- (4) Windows NT-dependent.
- (5) Depends on modem used.

ARAP = AppleTalk Remote Access Protocol

CHAP = Challenge Handshake Authentication Protocol

CMIP = Common Management Information Protocol

LAP-B = Link Access Procedure-B

PAP = Password Authentication Protocol

RADIUS = Remote Authentication Dial-In User Service

SLIP = Serial Line Internet Protocol

Editor's note:

Microsoft declined to participate.

Remote LAN access

Company	Product	Type	Max. no. of ports	NOS					WAN interfaces				Dial-up protocol	Protocols routed				Features		Security						Mgmt. agents				Price
				L= LAN W= WAN	AppleTalk	LAN Server	NetWare	Windows NT Server	Other	Analog dial-up	Frame relay	Fractional T-1/T-1		ISDN BRI	AppleTalk	IPX	TCP/IP	VINES IP	Max. number of LAN sessions	Data compression ratio	CHAP	Dial-back	Encryption	PAP	RADIUS	Other	Proprietary	SNMPv1	SNMPv2	
Andrew Corp. (800) 328-2696	Remote Lynx/2000	Hardware	L: 1 W: 135		✓	✓	✓	✓	✓			✓	PPP, other		✓	✓	✓	135			✓	✓				✓				\$3,600-\$35,730
Ascend Communications, Inc. (800) 621-9578	Max family	Hardware	L: 1 W: 96	✓	✓	✓	✓		✓	✓	✓	✓	PPP		✓	✓		95	4:1	✓	✓		✓	✓	✓	✓	✓		✓	\$13,500-\$60,000
	Pipeline ISDN family	Dial-up bridge/router	L: 1 W: 1	✓	✓	✓	✓				✓	✓	PPP		✓	✓		2	4:1	✓	✓		✓	✓	✓	✓	✓	✓	✓	\$895-\$1,695
	Pipeline 400	Hardware	L: 1 W: 23	✓	✓	✓	✓		✓	✓	✓	✓	PPP		✓	✓		23	4:1	✓	✓		✓	✓	✓	✓	✓	✓	✓	\$5,000-\$6,000
Attachmate Corp. (800) 426-6283	RLN Access Server 4.0	Hardware	L: 1 W: 32	✓	✓	✓	✓	✓	✓			✓	ARAP, PPP	✓	✓	✓		32	4:1	✓	✓	✓	✓		✓					\$4,575-\$17,935
	RLN 4.0	Software	L: 32 W: 32	✓	✓	✓	✓	✓	✓			✓	ARAP, PPP	✓	✓	✓		32	4:1	✓	✓	✓	✓			✓				\$985-\$15,835
Banyan Systems, Inc. (800) 222-6926	Server-to-Server WAN Options for VINES	Hardware, software	L: 6 W: 6			✓			✓			✓	SLIP		✓	✓	✓	No limit				✓	✓		✓	✓	✓			\$1,755-\$3,995
Black Box Corp. (412) 746-5500	Async Router family	Dial-up bridge/router	L: 1 W: 5				✓	✓		✓			PPP, SLIP		✓	✓		No limit		✓			✓		✓	✓		✓	✓	\$1,695-\$4,995
Cayman Systems, Inc. (800) 473-4776	Gator Link	Hardware	L: 1 W: 3	✓						✓			ARAP	✓		✓		3			✓				✓	✓				\$595
Cisco Systems, Inc. (800) 553-6387	AS5100	Hardware, software	L: 3 W: 51	✓	✓	✓	✓	✓	✓	✓	✓		ARAP, PPP, SLIP, other	✓	✓	✓	✓	(1)	4-8:1	✓	✓		✓		✓	✓	✓	✓	✓	\$33,388-\$76,382
	CiscoPro 753	Dial-up bridge/router	L: 1 W: 1	✓	✓	✓	✓					✓	PPP, other		✓	✓		No limit	4:1	✓	✓		✓			✓	✓	✓	✓	\$1,399-\$1,799
	Cisco 1000 series	Dial-up bridge/router	L: 1 W: 2	✓		✓	✓		✓	✓		✓	PPP	✓	✓	✓			4:1	✓			✓				✓	✓	✓	\$1,395-\$1,695
	Cisco 2509-2512	Hardware	L: 1 W: 19	✓	✓	✓	✓		✓	✓	✓		ARAP, PPP, SLIP	✓	✓	✓	✓	(1)	8:1	✓	✓		✓		✓	✓	✓	✓	✓	\$2,695-\$4,995
	Cisco 4000 series	Dial-up bridge/router	L: 18 W: 46	✓	✓	✓	✓	✓		✓	✓	✓	ARAP, PPP, SLIP	✓	✓	✓			4:1	✓	✓		✓		✓		✓	✓	✓	\$6,700-\$20,200
	Everyware 2050 and 2060	Dial-up bridge/router	L: 1 W: 1	✓	✓	✓	✓					✓	PPP		✓	✓		1,500	4:1	✓	✓		✓			✓	✓	✓	✓	\$999-\$1,699
Citrix Systems, Inc. (800) 437-7503	WinFrame for Networks	Software	(2)		✓	✓	✓	✓	✓	✓	✓	✓	PPP, SLIP, other		✓	✓		No limit	3:1	✓	✓	✓	✓				✓	✓		\$5,995
CommVision Corp. (415) 254-9300	CommSwitch 1000 and 2500	Hardware	L: 576 W: 576		✓	✓	✓		✓	✓	✓	✓	ARAP, PPP, SLIP	✓	✓	✓		576	2:1		✓		✓					✓		\$7,495-\$13,695
Compatible Systems Corp. (800) 356-0283	RISC Router 3800R	Dial-up bridge/router	L: 1 W: 12	✓	✓	✓	✓		✓	✓	✓	✓	PPP, other	✓	✓	✓		12		✓	✓		✓		✓	✓		✓	✓	\$3,495
Cubix Corp. (800) 829-0550	CubixConnect	Hardware	L: 64 W: 0				✓			✓		✓	ARAP, PPP, SLIP	✓	✓			64	4:1		✓	✓	✓				✓			\$10,000-\$31,000
Cylink Corp. (408) 735-5800	Secure Access System	Hardware, software	L: 892 W: 892	✓	✓	✓	✓	✓	✓				ARAP, PPP, SLIP, other	✓	✓	✓	✓	892			✓	✓		✓						\$31,500
Develcon Electronics, Ltd. (800) 667-9333	Orbitor family	Dial-up bridge/router	L: 1 W: 2	✓	✓	✓	✓	✓		✓	✓	✓	HDLC, LAP-B		✓	✓		512	6:1			✓					✓		✓	\$595-\$2,895
	Orbitor 6000	Hardware	L: 1 W: 14	✓	✓	✓	✓	✓		✓	✓	✓	HDLC, LAP-B		✓	✓		No limit	6:1							✓	✓	✓	✓	\$8,750-\$13,650
Digi International, Inc. (800) 344-4273	Digi LANAserver	Hardware	L: 1 W: 10		✓	✓	✓	✓	✓			✓	PPP		✓	✓		10		✓	✓		✓		✓	✓				\$1,695-\$3,895
	Sync/570 family	Hardware, software	L: (3) W: 16	✓	✓	✓	✓	✓	✓	✓	✓	✓	PPP, other	✓	✓	✓			4:1	✓	✓		✓				✓	✓		\$595-\$3,540
Digital Equipment Corp. (800) 457-8211	NetRider Remote Access Server	Hardware, software	L: 1 W: 32	✓	✓	✓	✓		✓				PPP, SLIP					32		✓			✓		✓	✓		✓		\$1,990-\$9,345
Eicon Technology, Inc. (800) 803-4266	Diva	Dial-up bridge/router	L: 0 W: 2		✓	✓	✓					✓	PPP, other		✓	✓	✓	1		✓	✓		✓							\$595-\$695
	Multiservice Access Card	Hardware	L: 0 W: 3		✓	✓	✓	✓			✓	✓	PPP, other			✓			2:1	✓			✓				✓			\$1,495
	WAN Services for NT	Hardware	L: (4) W: 36				✓	✓	✓	✓	✓	✓	PPP, other			✓		8	1.2-8:1	✓			✓					✓		\$595-\$1,495
Emulex Network Systems, Inc. (800) 590-5773	Connect Plus LT and PRO	Hardware	L: 1 W: 8				✓		✓	✓		✓	ARAP, PPP, SLIP					8	8:1	✓	✓	✓	✓		✓	✓	✓	✓	✓	\$899-\$2,895
Evergreen Systems, Inc. (415) 897-8888	CAPserver 2000/1000	Hardware	L: 0 W: 128	✓			✓			✓		✓	ARAP, PPP	✓	✓	✓		128	4:1	✓	✓			✓		✓	✓			\$6,995
Funk Software, Inc. (800) 828-4146	WanderLink	Software	L: 16 W: 64				✓			✓			PPP		✓	✓		64	2-4:1	✓	✓	✓	✓		✓	✓				\$295-\$2,595
Gandalf Technologies, Inc. (800) 426-3253	XpressConnect family	Dial-up bridge/router	L: 1 W: 2	✓	✓	✓	✓		✓	✓	✓	✓	PPP, other			✓		2,000	8:1	✓			✓		✓		✓		✓	\$1,145-\$2,495
	XpressWay	Hardware	L: 132 W: 170	✓	✓	✓	✓		✓	✓	✓	✓	PPP, SLIP, other	✓	✓	✓		4,000	8:1	✓			✓		✓		✓		✓	\$15,900-\$54,000
	XpressStack	Hardware	L: 1 W: 24	✓	✓	✓	✓					✓	PPP, other					4,000	8:1	✓			✓		✓		✓		✓	\$7,000-\$10,500
Global Village Communication, Inc. (800) 736-4821	OneWorld family	Hardware	L: 2 W: 2	✓						✓			ARAP					2	2:1		✓				✓	✓				\$1,499-\$2,099
Hewlett-Packard Co. (800) 533-1333	AdvanceStack Dial-A-LAN Modules	Hardware	L: 4 W: 4	✓	✓	✓	✓		✓			✓	ARAP, PPP, SLIP	✓	✓	✓		4	4:1	✓	✓	✓	✓				✓		✓	\$2,399-\$3,099
IBM (800) 426-2255	8235 Dial-In Access to Servers	Hardware	L: 1 W: 8	✓	✓	✓	✓	✓	✓			✓	ARAP, PPP, SLIP	✓	✓	✓		1	4-5:1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	\$4,760-\$10,890
IBM Personal Software Products Division (800) 342-6672	LAN Distance	Software	L: 1 W: 135		✓	✓	✓	✓	✓		✓	✓	ISO 3309		✓	✓	✓	No limit	(5)		✓	✓			✓	✓				\$59-\$1,995
J & L Information Systems (800) 456-1333	ChatAccess	Hardware	L: 8 W: 8		✓	✓	✓		✓			✓	PPP, SLIP		✓	✓	✓	8		✓			✓							\$1,695-\$3,895
Lantronix (800) 422-7055	LRS2	Dial-up bridge/router	L: 1 W: 2				✓		✓	✓			PPP, SLIP, other		✓	✓		16		✓	✓	✓	✓		✓	✓		✓		\$995
LeeMah DataCom (800) 331-2734	LAN-Reach	Hardware	L: 1 W: 2				✓		✓	✓			Proprietary		✓	✓		2	4:1		✓				✓	✓				\$995
Linksys (800) 546-5797	LANgate Remote Node Server	Hardware	L: 1 W: 0				✓		✓				PPP, SLIP		✓	✓		1	(5)		✓			✓	✓		✓			\$310-\$400
Livingston Enterprises, Inc. (510) 426-0770	PortMaster family	Hardware	L: 1 W: 31						✓	✓	✓	✓	PPP, SLIP		✓	✓		30		✓	✓		✓	✓		✓	✓	✓	✓	\$1,395-\$4,440

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The choice depends on the number of remote users you have, where they are and how often each of them requires central-site LAN access (see story, this page). But there are some rough guidelines to follow for figuring out how many ports you'll need.

If you have users with intermittent access needs, an average of one central-site port for every five remote users is workable. For busy networks or conservative network planners, one port for every three users is better. If the net is not heavily used, you can get by with one port for every 10 users. But keep in mind that some "power" telecommuters will require their own port.

If you need to support a very large number of remote users with unpredictable calling patterns, you might consider products with ports that can handle multiple calls at once. This will lessen port contention problems and may even bring economies of scale if you groom incoming dial-up calls over a dedicated link to the central site.

Products from vendors such as Ascend Communications, Inc., Gandalf Technologies, Inc., Shiva, 3Com and Xylogics can do just that.

Xylogics' Remote Annex 6100, for example, supports a channelized T-1 WAN link via a integrated data service unit/channel service unit, a T-1 multiplexer and 24 V.34 modems. Incoming calls are routed to the T-1 line, from where the product passes them to individual modems, which answer the call. From there, remote access software establishes a LAN link for each caller through the unit's Ethernet interface.

Other servers — including units from Shiva, Gandalf's Xpress series, Ascend's Max fam-

ily and 3Com's AccessBuilder 4000 — can aggregate incoming calls over an ISDN Primary Rate Interface circuit.

The Ascend, Shiva and 3Com servers have an added capability to support analog modem calls over the PRI link using digital modem technology. This allows the telephone company to signal the server over the PRI's D channel that an incoming call is analog. The server uses integrated ISDN net termination equipment and built-in analog modems to answer that call.

If your remote users are telecommuters or branch office workers, the best solution might be to connect them to a LAN, then interconnect that LAN to a central site via a dial-up router.

If a remote user launches an application such as a file transfer using the File Transfer Protocol or a telnet session to a host, the router automatically sets up a call to the appropriate network and tears it down when it's no longer needed. This is a fairly standard feature in routers.

Most of these dial-up routers employ sophisticated spoofing and filtering techniques to limit unnecessary traffic and maintain the appearance of a link even when it is not there. Some routers even enable network managers to control the settings for session spoofing, which helps make sure the router does not maintain LAN connections once remote users finish their work.

Remote security

Knowing there are so many options for dialing in to a LAN where the corporate jewels are kept strikes fear in the heart of a network planner. Fortunately, remote access vendors are cooperating to provide security for just about every need.

The first line of defense is access control, which can be provided in a number of ways, including the use of add-on security hardware, restricted node addresses, caller identification and dialback. The add-on hardware-based security devices provide either a serial number or passcode, which is verified by the remote access server before net access is granted. Restricted addressing, caller ID and dialback ensures that a remote user can only call in from certain locations. Each of these options is widely supported.

The second level of security is in caller authentication, which basically means you

make sure no one can masquerade as an authorized user. The simplest authentication method used in PPP-based remote nodes is the Password Authentication Protocol (PAP), which requires the remote node to send an unencoded user ID and password. The remote LAN access device validates those pieces of information before establishing a link. However, because both pieces of information are sent unencoded, PAP authentication is susceptible to eavesdropping.

For this reason, most vendors now support a variant of the Challenge Handshake Authentication Protocol (CHAP). With CHAP, the remote access server sends a unique 16-character code called a challenge to the remote user each time a logon is attempted. The remote user's password is then encoded with a response to the challenge and sent to the server. Encoding the data and use of a different challenge each time a logon is attempted reduces the chance that an eavesdropper will pluck security information off the wire.

There is another CHAP method that uses tokens along with a third-party security device such as the SecureID card from Security Dynamics, Inc.

In this approach, the server still sends a challenge but the remote user must enter information into the third-party security device along with their personal identification number (PIN). The device encodes the user's PIN and the challenge into a single-use password.

Administration department

One of the biggest problems with remote access security has been the need to manage it on a server-by-server basis. User names, passwords and access control lists have traditionally been stored on the remote access server. In larger networks, this quickly becomes cumbersome and unmanageable.

Again, the remote access vendors are meeting the problem head-on via centralized security servers.

In some cases, the security server utilizes an existing NOS directory such as Novell's NetWare Directory Services (NDS) in NetWare 4.X or the bindery directory in NetWare 3.X. Novell's NetWare Connect 2.0 uses NDS authentication to control what a remote user can access and when. Since NDS is replicated across servers, settings for a particular user apply anywhere on the net and there is a single point of administration. Shiva and 3Com have used NDS

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Look before leaping into evaluations

Before you plunge into a full-fledged product evaluation, you should understand your connectivity needs and plan accordingly.

For mobile users, it would be convenient to provide toll-free dial-up access. When deciding the number of dial-up links you'll need, consider how users will react if they hit a busy signal. Order more lines if you want to keep the natives from getting too restless.

In the meantime, telecommuters in the same local exchange as the central site may be better off with dedicated access. Otherwise, consider an ISDN line. Thanks to ISDN's quick call setup time, a link can be established, transfer needed data and then be torn down without the remote user ever knowing it happened.

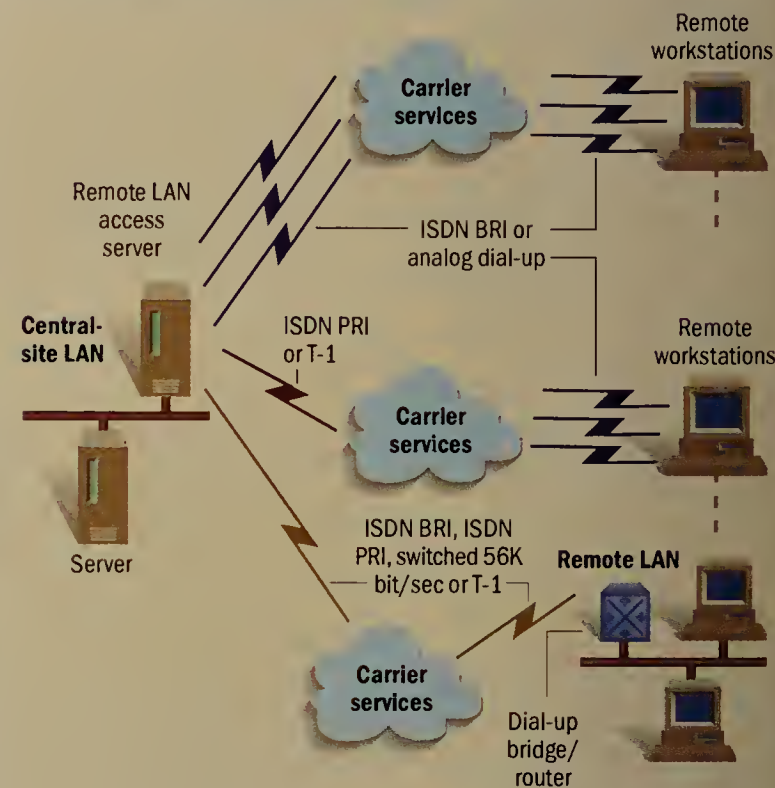
There are three ways to fit remote LAN access into your network picture. You can have each port on the central site device handle one call at a time; have each port handle multiple calls at once; or use a dial-up bridge/router.

Handling one call at a time requires identical equipment and lines such as analog modems and dial-up lines or ISDN Basic Rate Interface terminal adapters and circuits on each side of the carrier cloud. That can get expensive if you have lots of people calling in often.

But this approach works well if you have a few people who dial in often or even many people who dial in infrequently but in predictable cycles, such as field service personnel who call in for several minutes each morning.

REMOTE CONNECTIVITY OPTIONS

Here's three ways to configure remote LAN access.



If lots of remote workers call in often or even a small number call in for long periods of time, you'd probably be better off with an access device that supports multiple calls per port. This device enables you to have a leased line such as a channelized T-1 or an ISDN Primary Rate Interface from the carrier to the central site. Remote users would still use a modem or an ISDN BRI terminal adapter and appropriate circuit to dial up a link.

Carrier tariffs will obviously also play a role in determining when it becomes more cost-effective to cut over from dial-up to leased-line links to the central site.

Dial-up routers can be effective when you're connecting a small workgroup — even a single telecommuter — to your entire internetwork. This is also a popular method of connecting the corporate network to an Internet service provider, and then providing Internet access to both the corporate network and remote users.

The router dials up a high-speed connection using ISDN, switched digital or fractional T-1 services when a remote resource is requested, and tears it down once transmission is complete.

Check out what it'll cost you for remote LAN access equipment on Network World Fusion at <http://www.nwfusion.com>. Select NetRef then Buyer's Guides after you log in. We're asking vendors to supply pricing for a sample configuration posted in the Buyer's Guide area.

While visiting the Buyer's Guide area, you can download a copy of this story and the product chart, plus look for links to our recent remote LAN access test.

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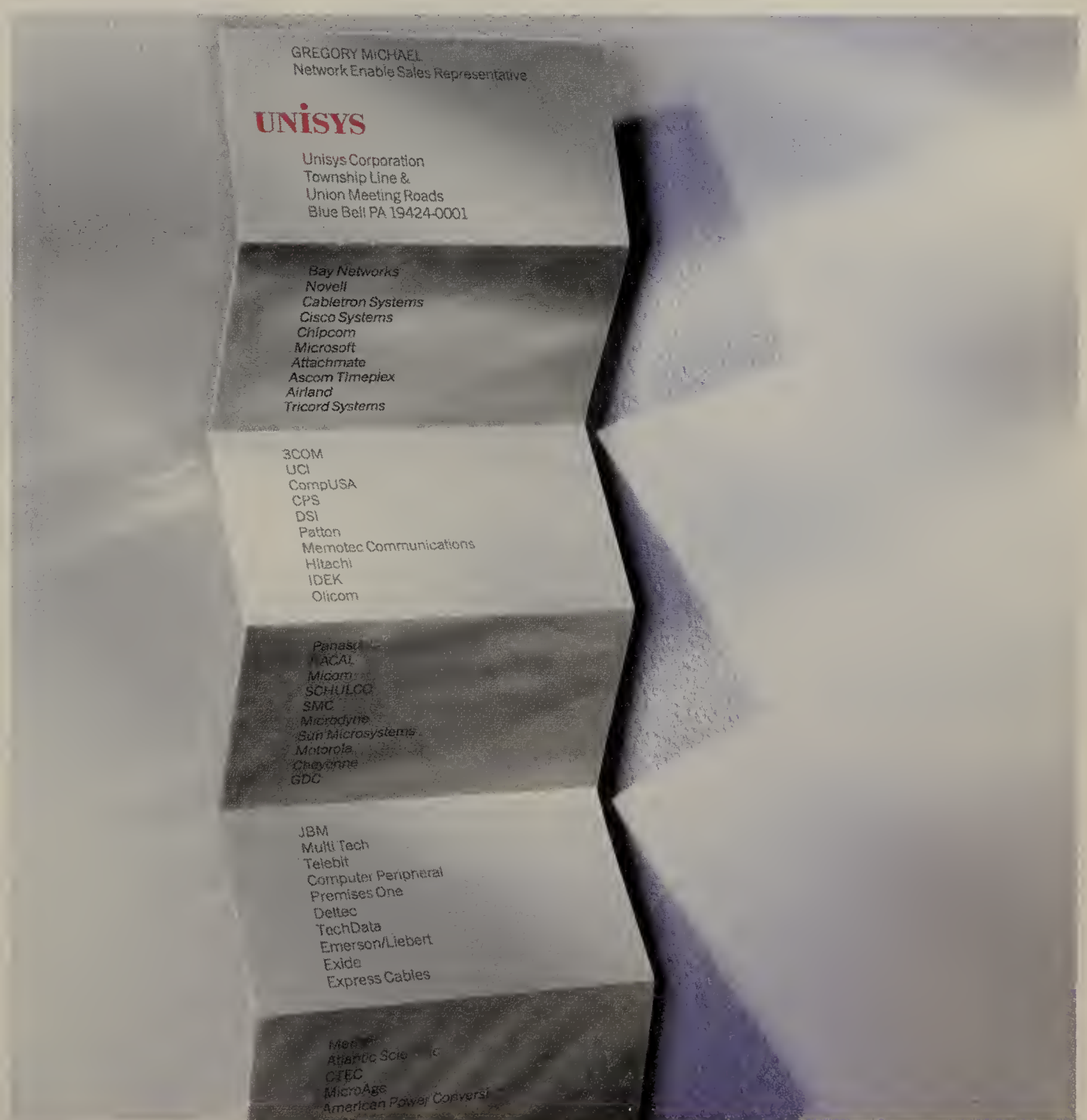
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Continued from page 60

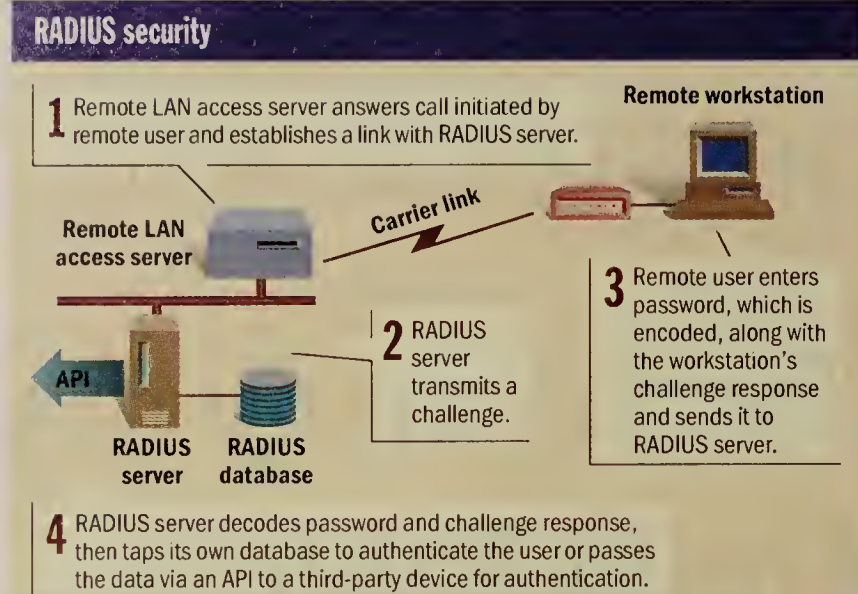
as well as bindery services for managing security in their remote LAN access products.

Attachmate's RLN 4.0 provides a proprietary domain-based user management system called Distributed Authentication Services.

The domain is a logical way of grouping remote access servers so they share common security data. When remote users log on, slave servers check for access permission on a master server before granting access.

Similar security servers are available in many other products. 3Com, for instance, sells its AccessBuilder Name Server, while U.S. Robotics offers its Total Control Security Server. Both are largely proprietary, providing security management only for the vendors' respective remote access offerings.

However, two protocols for communicating with third-party



security servers are gaining momentum: Cisco Systems, Inc.'s Terminal Access Controller Access Systems (TACACS) and the Remote Authentication Dial-In User Service (RADIUS), which was developed by Livingston Enterprises, Inc. and is now a draft Internet Engineering

Task Force specification.

Both protocols provide methods for carrying encrypted tokens and passwords between remote access servers and authentication/security servers such as Security Dynamics' ACE/Server, Enigma Logic, Inc.'s SafeWord, Novell's NetWare NDS and Digital Pathways, Inc.'s Defender Security Server. Open APIs permit vendors to provide support for other authentication systems, such as those included in Windows NT domain services and Banyan Systems, Inc.'s StreetTalk.

One difference between the protocols is that TACACS only defines a protocol for moving authentication data between a remote LAN access device and a security server, whereas RADIUS defines a protocol and additional facilities for caller accounting and controlling access to specific network resources. These additional services have allowed RADIUS to gain favor with remote LAN access device vendors and Internet service providers.

To use RADIUS, a remote access server must function as a RADIUS client. When remote nodes request access to central-site resources, the client is responsible for communicating with the security server and validating that request (see graphic). Ascend, Evergreen Systems, IBM, Linksys, Livingston, U.S. Robotics and Xyplex are among the vendors that currently provide built-in RADIUS clients.

Don't fail me now

On the reliability front, there is little variation among stand-alone remote access servers. Chassis-based and modular products enable you to swap out failed boards and support some form of redundant interfaces and power supplies.

If you're considering a software-based product, it'll be well worth the time to look at a spe-

cialty remote access platform on which to run it, such as Cubix Corp.'s ERS/FT, or J & L Information Systems' ChatterBox.

Cubix bundles remote access software with its hardware in its CubixConnect product, while J & L does the same in its ChatAccess product. But the Cubix and J & L hardware can be used to run nearly any software-based remote LAN access product.

Cubix's hardware supports a bunch of fault-tolerant features, including dual load-sharing and hot-swappable power supplies, a dedicated management processor and intelligent environmental monitoring. Other features deal with remote access-specific issues, such as automatic hardware reset for locked-up processors.

Bright future

The remote access market is red hot and shows no signs of cooling off. This means continued competition for market share, which will lead to better products and, eventually, services.

Over the next year or two, it's likely that carriers will begin trying to get you to outsource your remote access business. AT&T, CompuServe, Inc., MCI Communications Corp. and Sprint Corp. are already developing services. These carriers will likely encounter a long, hard road trying to convince paranoid information systems managers that outsourcing is the right thing to do; but the recent agreement between Northern Telecom, Inc. and Shiva to build carrier-class remote access servers should have you believing they see a viable market.

Don't give up on the Internet service providers either. As more secure Internet software becomes available from CommerceNet, the alliance between Microsoft Corp. and Visa International, Inc., or others, you might soon see the remote LAN access purchase decision shifts from selecting hardware or software to picking a service

provider.

Until then, your buying decision will be made in a world of convergence — a world in which vendors from different backgrounds continue to learn from one another and provide you with more robust tools for economically maintaining a busy passageway to information that remote users can visit whenever and from where ever they want.

Croes is a senior analyst with Currid & Co., a Houston-based technology consulting firm. He can be reached via the Internet at tcroes@ngwgate.mhs.compuServe.com or by phone at (713) 789-5995.

Remote LAN access

The Short List highlights products Network World recommends you examine when buying remote LAN access servers. The products mentioned here have features for supporting different remote access configurations and can meet the needs of users with multivendor enterprise networks. Your needs may differ.

NetworkWorld Short LIST

Ascend Communications, Inc.'s Max family provides WAN cost savings by aggregating remote node traffic onto one or more high-speed links, including ISDN Primary Rate Interface to the central-site LAN. The Max family also supports digital modem technology, which enables it to handle analog or digital calls over the same carrier link. Ascend is also working to further its Multi-link PPP (MP) standard for using more than one ISDN B channel with PPP connections.

Novell, Inc.'s NetWare Connect 2.0 gets high marks for integration with NetWare Directory Services and ConnectView management tools, which add accounting capabilities and trend analysis to basic remote LAN connectivity. NetWare Connect 2.0 further utilizes the underlying capabilities of the NetWare network operating system, including its security and internetworking features. The software-based product also scales well, handling two to 256 ports on a server platform.

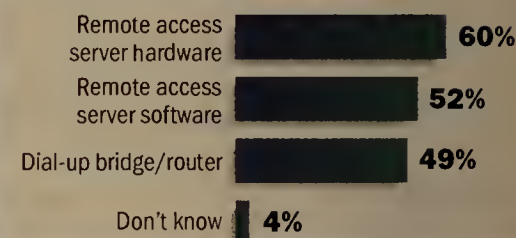
Shiva Corp. covers most of the bases, from single-port and multiport NetModems to the stackable LanRover family. Shiva also acquired Spider Systems, Ltd. and will use that company's technology in its ShivaIntegrator and ShivaPort products. Shiva also gets high marks for licensing its flexible ShivaPPP remote node software, which is opening the market for network applications with integrated remote node features.

3Com Corp.'s family of AccessBuilder products work well in the high end and mid-range of the market. The top-of-the-line AccessBuilder 4000 is a modular server supporting a number of WAN interfaces, including high-speed asynchronous, T-1 and ISDN links, which enable users to aggregate incoming dial-up traffic on more cost-effective circuits. The entry-level AccessBuilder products support asynchronous serial ports for incoming traffic and works with a wide variety of remote node access hardware, including ISDN terminal adapters and the most advanced modems.

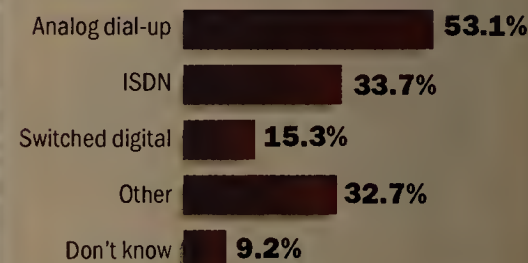
Reader views on remote LAN access

Based on 100 interviews.

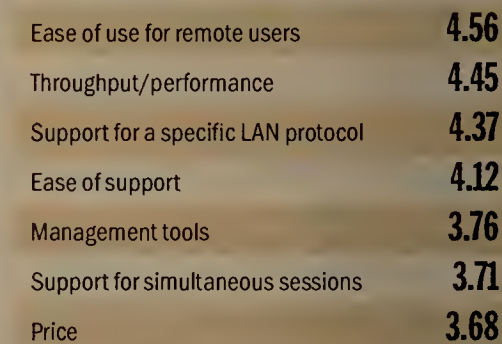
What type of product do/will you use?



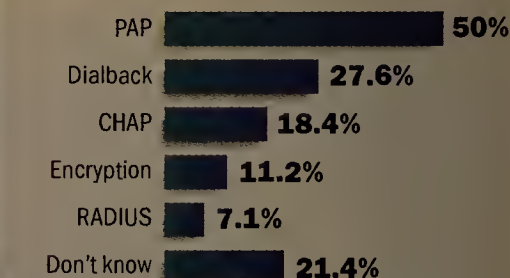
What WAN service do/will you use?



Top selection criteria (Based on highest possible score of 5.)




Which security methods do/will you use?



CHAP = Challenge Handshake Authentication Protocol
PAP = Password Authentication Protocol
RADIUS = Remote Authentication Dial-In User Service

Focus Data, an independent market research firm in Framingham, Mass., conducted this survey. Focus Data specializes in gathering primary data from end-user organizations regarding their enterprise network environment and needs. For more information about Focus Data services, send E-mail via the Internet to mdabbon@focusdata.ultranet.com or call Mona Dabbon at (508) 626-2556.



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A hauntingly good E-mail package

Pronto Mail's user interface is bewitchingly alluring.

By Lee Schlesinger

NetResults

Product
Pronto Mail 2.0

Vendor
CommTouch Software, Inc.
1206 W. Hillsdale Blvd.
Suite C
San Mateo, Calif. 94403
Phone: (415) 578-6580
Fax: (415) 578-8580
E-mail:
pronto@commtouch.com
URL:
http://www.commtouch.com

Price
\$69

Pros

- ▲ Top-notch user interface.
- ▲ Customizable toolbar.
- ▲ Rules processing.
- ▲ Many user options.
- ▲ Bundled spell-checker.

Cons

- ▼ Menu and window layout take a little getting used to.

We've been ringing doorbells all over our network neighborhood in search of an SMTP E-mail client that works the way we do. We've been frustrated by applications designed by people who, it seems, don't use the products they create. We've tried and tossed out a stack of candidates — from NetManage, Inc.'s Chameleon Mail to Microsoft Corp.'s new Exchange client — but finally found a holiday treat in CommTouch Software, Inc.'s Pronto Mail 2.0.

You may be using Pronto Mail now without even realizing it. The product provides the E-mail client for TGV, Inc.'s MultiNet for Windows, SunSoft, Inc.'s SolarNet, Walker Richer & Quinn, Inc.'s Reflection Network Series, and Attachmate Corp.'s Irma TCP Suite and CrossTalk.

What makes Pronto Mail so palatable? Its user interface, which is logically laid out and easy to use.

Pronto Mail offers a customizable toolbar that includes most of the common functions we use every day. The default toolbar offers small buttons for creating, replying to, forwarding and deleting messages. We moved a few buttons to suit our tastes and extended the toolbar; we selected and inserted a button

that allowed us to add users to the product's address book.

Creating or replying to a message puts you right in the To field, which is the first field a user thinks of when sending a message, instead of the Subject field, which Chameleon Mail focuses on (see Figure 1). You can enter an address manually or choose it from an address book that's available as a button on the Compose screen. Pronto Mail supports just a single address book.

When you reply to a message, buttons at the top of the Compose screen let you choose on the fly whether to include the original message. We prefer this approach to that taken by some products, which offer only the ability to set this option for all messages or require you to click on different menu choices depending on which option you want.

In addition to the To field, Pronto Mail offers both copies

and blind copies. The latter recipients cannot be seen by those listed in the To and CC fields.

SENDING PRONTO MAIL Figure 1

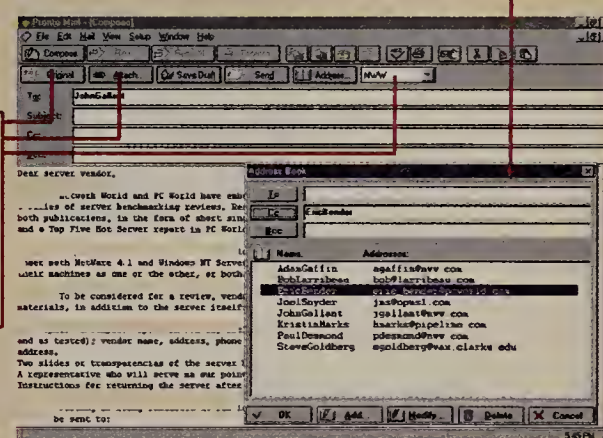
Other buttons let you include original messages when replying, add attachment files and change signature files.

window and the beginning of the text in the bottom one. Messages can be sorted by any field, and the two halves of the window can be resized relative to each other.

New mail causes the program's icon to flash when the application is minimized, which we found a bit annoying; we'd have preferred it to change color or raise a red flag on the icon. You can also set the program to beep once, in addition to flashing, to notify you of new mail.

Pronto Mail lets you leave messages on the server, even after they've been downloaded, rather than deleting them. If you choose to leave them, the program realizes they've already been read and doesn't attempt to download them again the next

A button on the Compose window brings up an address book and allows you to choose recipients.



Another button lets users attach files as Multi-purpose Internet Mail Extensions (MIME) attachments, with several options for MIME types and encoding.

Clicking on the Send button forwards a message to the Simple Mail Transfer Protocol server either immediately or at an interval you can specify for checking server mail.

The mail's here

Incoming mail is copied to the program's Inbox folder, which lists the message sender, date and subject fields in the top

time it checks for mail. (We delete messages when we're in the office but leave them on the server when we're on the road.)

In addition to the Inbox, the program, by default, sets up a Draft folder for messages you want to save before you send as well as a Sent Log folder, which automatically saves a copy of outgoing messages. There's also a wastebasket for deleted mail, which is typically emptied when you exit the program. You can, of course, create any number of folders to categorize your messages any way you like.

Continued on page 66

Tricks

Windows-based SMTP E-mail clients we tried and tossed out:

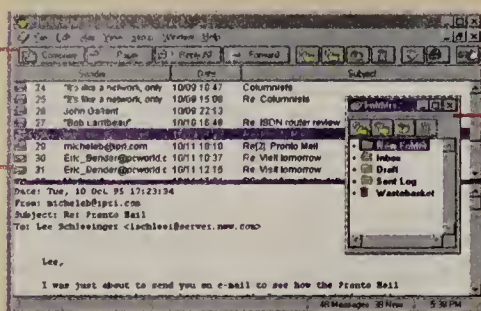
- ▶ CompuServe Internet Division's Air Mail
- ▶ David Harris' Pegasus Mail
- ▶ Microsoft's Exchange
- ▶ Network Computing Devices' Z-Mail
- ▶ NetManage's Chameleon Mail
- ▶ Qualcomm's Eudora Light

WHEN MAIL ARRIVES

Figure 2

The toolbar is highly customizable.

The Inbox folder shows a message list above the text of the highlighted message.



The Folders window shows all available folders and lets you create new ones.

Continued from page 65

You can establish rules that automatically copy, move, delete, forward or reply to messages based on information in a half-dozen header fields.

The Rules Manager is simple to use and understand.

With each folder, you can view all messages or select a subset by date, sender, recipient, subject or even a string in the message body.

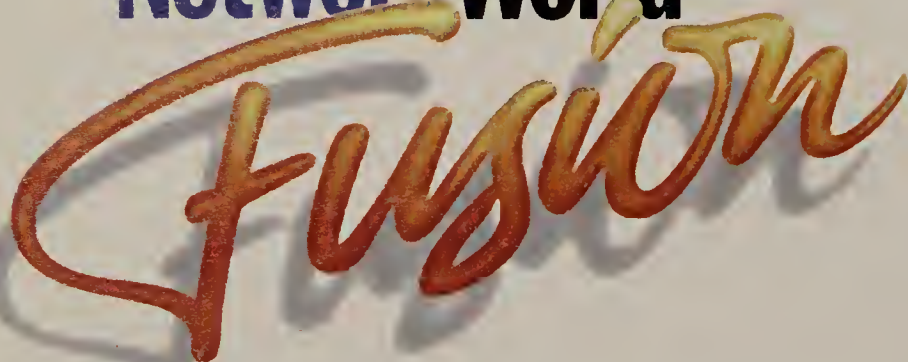
Likewise, you can choose to view full, partial or no-message headers. In other packages, we usually did not view headers unless we needed some particular information; with Pronto Mail, we like the partial header option, which gives only the date, sender, addressee and subject fields — the ones in which we're most interested.

Pronto Mail includes menu choices for importing and saving both text and binary files. In the latter case, the program automatically UUencodes or UUdecodes the binary files. There's even a spell-checker for outgoing messages.

However, a few things take some getting used to with Pronto Mail. For instance, we were more accustomed to a vertically oriented display that shows the available folders on the left of the screen and messages within a highlighted folder on the right, such as the type found in Microsoft Exchange and Chameleon Mail.

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Emily Post would be proud. You can

look up proper E-mail etiquette and download a demo copy of Pronto Mail 2.0 from Network World Fusion. Point your browser at

<http://www.nwfusion.com>. From the main menu, select NetRef

then Reviews and Buyer's Guides.



Instead, Pronto Mail lets you view folders in a floating window or make them disappear. On the plus side, this leaves more room to display header information and body text (see Figure 2).

Another minor annoyance: When the Folders window obscures part of the Inbox window, clicking on the latter doesn't bring it to the front, contrary to typical Windows behavior. We had to minimize the Folders window to move it out of the way.

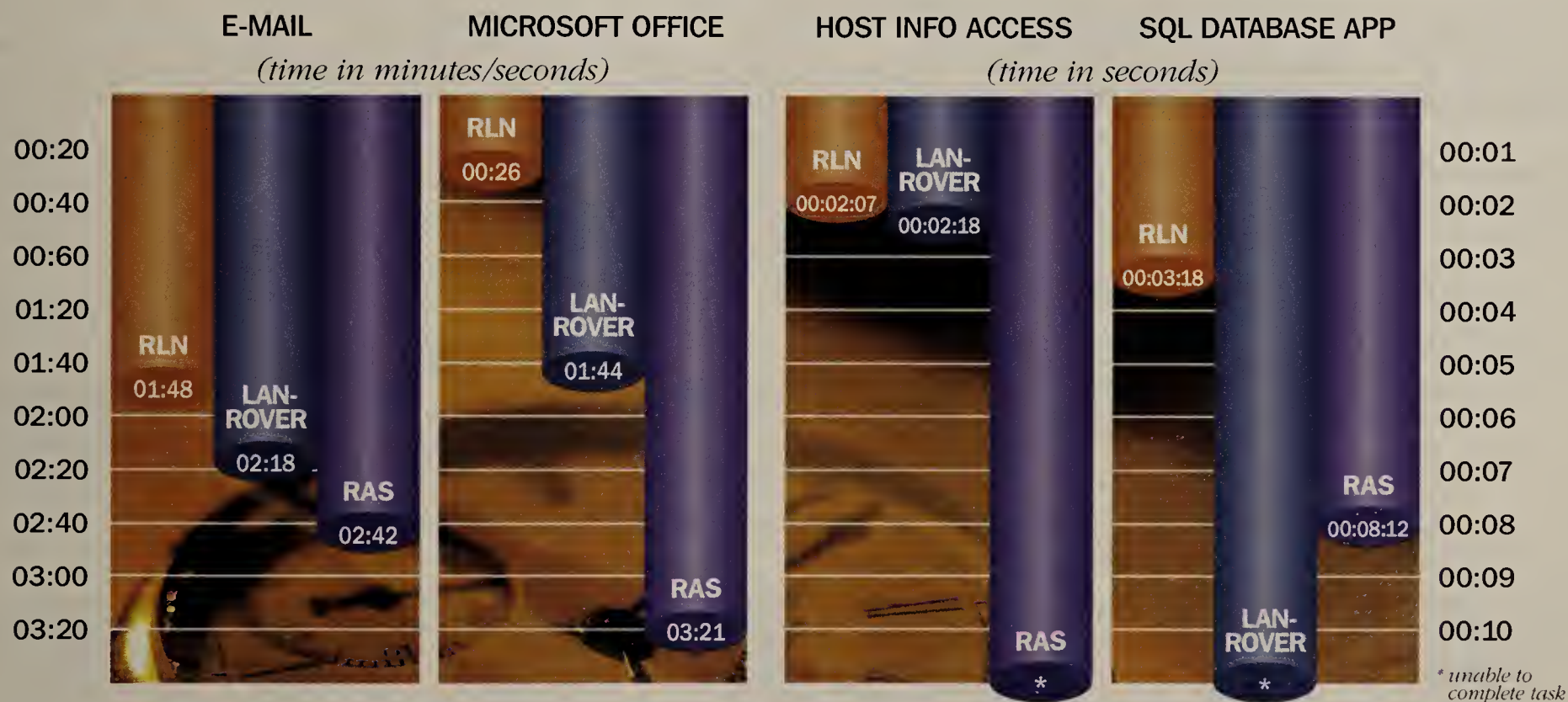
Finally, we wish the menu choices relating to folders were in their own menu column, rather than buried under the File menu.

However, given all that Pronto Mail provides, we really can't carp too loudly. For now, it has taken a place of honor in our Startup folder. ■

HOW WE DID IT

We tested Pronto Mail by installing it as our primary E-mail client and using it in our production environment. We created and sent messages with and without attachments. We received dozens of messages, some with MIME attachments, others with UUencoded files in the body of the message. We also customized our user interface and populated our address book.

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In all fairness, the odds were stacked against our competition. RLN is the only remote product that seamlessly integrates remote node and multi-user application server technologies into one solution. Everything from e-mail to host access, databases to LAN access, runs at optimal speed. That's top access to any app, on any network or host, from

anywhere using ISDN, X.25 or async.

RLN is not just fast, but easy, too. Remote users can be oblivious to whether they're using RLN or the RLN Application Server, because the system is configured to choose the fastest possible access path.

So if you need a solution that lets your remote users get to their applications faster than any other, give us a call. We'll fill you in on RLN's speed, plus its superior security, management and scalability features and our upcoming Windows® 95 release.



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Management Strategies

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Briefs

■ **Microsoft Corp.'s Microsoft Consulting Services (MCS)** announced a program that will help users **migrate to Windows 95** in three to eight weeks.

Under the service, MCS will review users' current environments to ensure Windows 95 compatibility. From there, MCS recommends how to design, test and evaluate Windows 95 desktop configurations. It then develops pilot project recommendations, rollout scenarios and a sample work plan outlining companies' tasks, responsibilities and resources.

MCS: (800) 426-9400.

■ **Compaq Computer Corp.** introduced a **System Service Provider (SSP)** program, which makes more resources available to its third-party service and support providers.

Under SSP, Compaq will help its service and support providers — which now include Digital Equipment Corp.'s Multivendor Customer Services organization — offer corporate users help desk service, local and remote network monitoring, administration and management, network tuning and LAN/WAN design.

Compaq: (713) 370-0670.

■ **Technology and Business Integrators (TBI)** has formed a **Technology and Business Institute** program where business executives and information technology (IT) managers can learn together how to solve business problems using networks.

The program includes seminars and other events on a number of topics, including IT valuation and plan alignment, workflow support, vendor evaluation, project management, metrics analysis and IT department restructuring. Program members will get a quarterly report, research reports, invitations to professional development programs and focus groups, and discounts on conferences and seminars.

TBI: (800) 676-9470.

Sidestepping the common pitfalls of recruiting

By Frank Schoff

Anyone who's left a primary job candidate hanging long enough to get scooped up by a competitor knows that failure to apply project management skills is the No. 1 pitfall in recruiting.

But there are many other pitfalls to avoid. Here are some major ones and suggestions for staying out of their snares.

PITFALL: LINEAR RECRUITING

The danger here is following a money-saving process geared to seeking out one leading candidate. You may move all the way to the offer stage with that candidate and get spurned. At this point, it's either back to square one or a scramble to contact other attractive candidates who perhaps found work somewhere else.

SOLUTION: USE CONCURRENCY

Try these procedures:

- ▶ Initiate simultaneous recruiting efforts for all candidates.
- ▶ Move to the offer stage with multiple qualified candidates.
- ▶ Identify and make an offer to your top candidate. Have another offer ready for a second candidate, and stay in touch with others until your first choice makes a decision.

Remember, the real payoff is getting the position filled with a productive contributor, not filling it at the lowest cost.

MORE ON-LINE

There are more recruitment strategies in the Careers area on Network Word Fusion at <http://www.nwfusion.com>. Visit today to get linked to a Web site that lists the top 25 electronic recruiters. You'll also find links to Frank Schoff's previous articles on job hunting and recruitment.

There's also a wealth of links to career-related sites.

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PITFALL: JOB DESCRIPTION RECRUITING

It is fairly common to use internal job descriptions as the basis for posting, advertising and listing jobs. The problem is that descriptions are a laundry list of responsibilities and may not entice job hunters who are interested in a position's challenges and opportunities.

SOLUTION: DEVELOP AN ATTRACTIVE PRESENTATION

Take these steps to lure qualified candidates:

- ▶ Use the job description to identify the challenges potential candidates will face.
- ▶ Identify growth opportunities for the successful employees in the company.
- ▶ Use growth opportunities as the basis for advertising, pass it along to recruiters, and make it the focus of your interviews.

PITFALL: FOCUSING ON THE IDEAL CANDIDATE AND RELYING ON RESUMES

These two pitfalls are closely related. There is a strong temptation to list in recruitment ads the skills and experience level an ideal candidate must have. In some cases, that list includes all the skills required for an entire department. How are you going to find a person who possesses all those skills?

In today's complex technological environment, it is almost impossible for a person to have all the skills and experience you require of an ideal candidate. Those who do also come with a high price tag — probably higher than you expected to pay. The risk of focusing on the ideal candidate is that many good applicants will be disqualified, or you will spend valuable time interviewing candidates you can't afford.

There is also a perception that it is possible to identify qualified candidates from information on their resumes. At best, a resume clearly presents contact information, chronological work history, academic credentials and a description of positions held and accomplishments. But a resume will not tell you whether the person can do or even wants the job.

SOLUTION: SHIFT YOUR FOCUS

When looking for candidates, seek answers to these questions:

- ▶ Does the candidate have the skills and experience required for the job?
- ▶ Does the candidate have the attitude and passion needed to do the job?
- ▶ Will the candidate adapt to the culture and behavior of your organization and its employees?

Define what it will take to get the answers you want to the questions listed above and develop your ads, resume screening and interviewing techniques around those attributes. You will still receive and review resumes and conduct more but shorter introductory interviews. In the long run, though, you will identify more candidates who meet your needs.

PITFALL: FAILURE TO SELL

Most hiring managers do not have well-developed sales skills. They may present factual information about the position and the company, but there is no attempt to translate those facts into the values they bring to a prospective employee.

SOLUTION: SELL, SELL, SELL

To get the candidate you want, you will need a well-developed presentation that sells your company and the position.

- ▶ Make the presentation a standard part of the interview process.
- ▶ Make the presentation to each candidate, whether or not you intend to extend an offer.
- ▶ Emphasize room for advancement, any unusual benefits and longevity of key personnel.
- ▶ Explain how the job will improve personal career growth.

Following these steps reaps benefits. Candidates who like what you say will sell themselves harder to get the job, thus giving information you may not have received. Candidates will also leave the office spreading the word about what a wonderful opportunity you are offering, perhaps enticing other qualified candidates to come forward.

PITFALL: NO CONTACT AFTER OFFER ACCEPTANCE

Picture this: You just landed the person you want after a 90-day search. You reviewed hundreds of resumes and interviewed dozens of candidates, some of whom flew in at considerable expense. Your boss reluctantly agreed to a compensation offer above the original range, and you've agreed on a start date three weeks away.

Now you go back to work, busily catching yourself up. Finally, the day arrives to prepare a welcome for your new employee. You call to confirm the person is all set to start and get an answering machine. Frustrated, you keep calling well into the night. Finally, the candidate answers and sheepishly confesses to accepting a counteroffer a few days before.

SOLUTION: STAY IN TOUCH

Contact your new employee at least once a week between the time the offer is accepted and the starting day.

This contact will:

- ▶ Reaffirm your satisfaction in hiring this person.
- ▶ Resell the position.
- ▶ Capture the employee's interest in working on future projects.
- ▶ Retest the employee's commitment.

Maintaining contact may very well offset the new employee's temptation to accept another offer. At least you would have learned about a counteroffer sooner and perhaps even been able to match it.

If you develop techniques to sidestep these pitfalls, your probability of recruiting success will improve significantly.

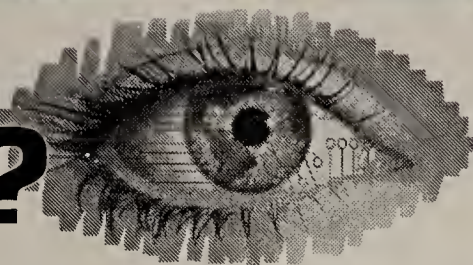
And always remember, the ultimate measure of success is landing a qualified person as quickly as possible after the need is identified.

Everything else is process.

Schoff is president of Cedar Mountain, N.C.-based Management Recruiters, which specializes in recruiting network and telecommunications professionals. He can be reached at (704) 884-4118.

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MAXNET offers top compensation, where Engineers & Salespeople earn considerably more than the industry average. Qualified applicants, please send your resume to our Corporate Headquarters located at: **1915A Hollywood Blvd., Dept. NW-EY, Hollywood, FL 33020**, e-mail to: hrevaz@4maxnet.com, or fax to: (305) 926-6683. E/O/E.



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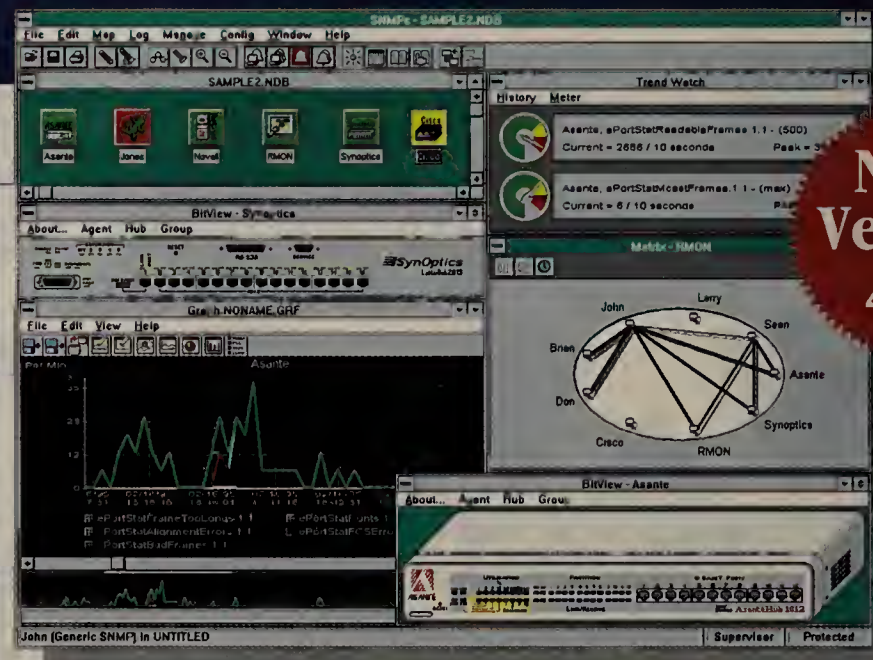
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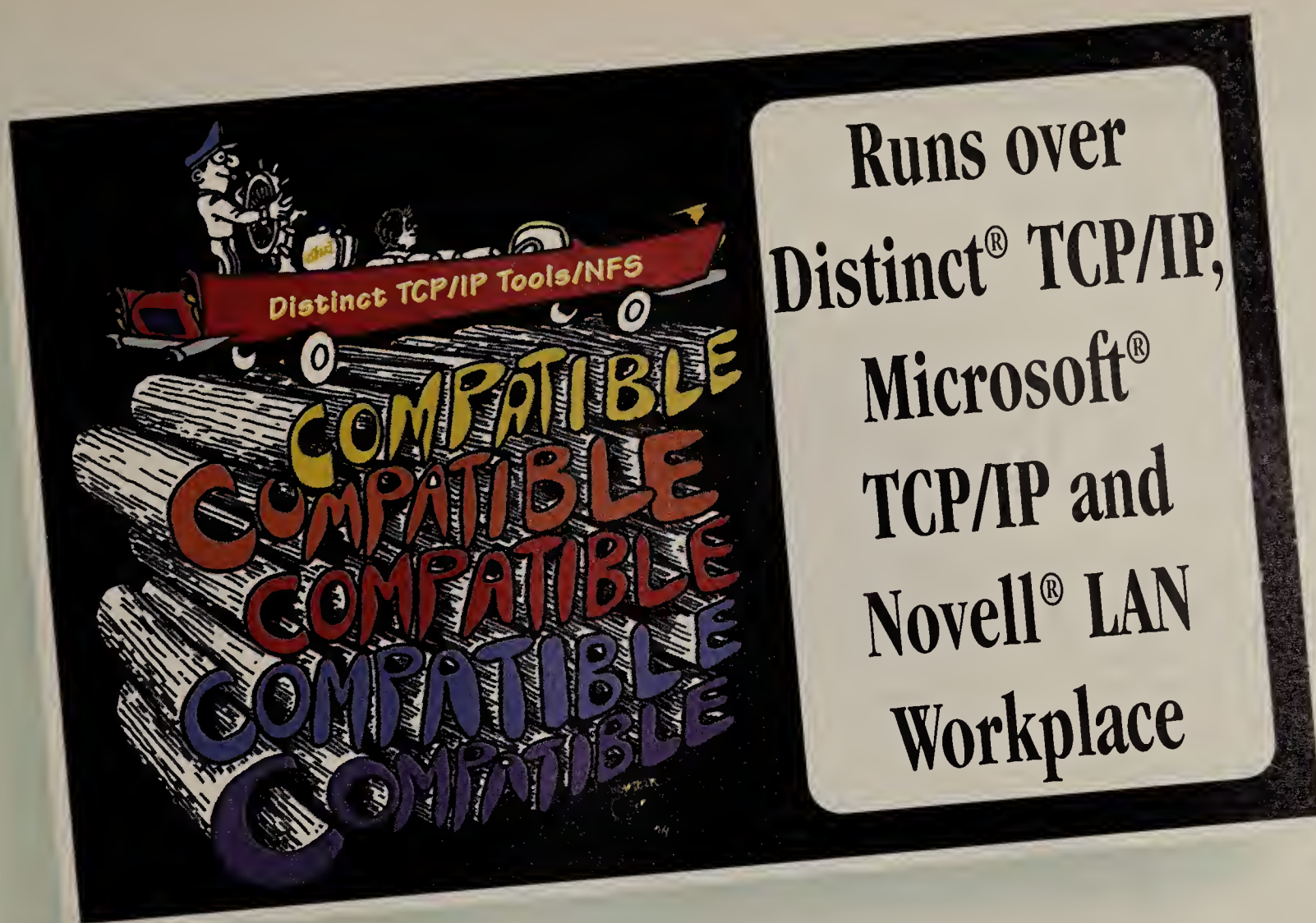
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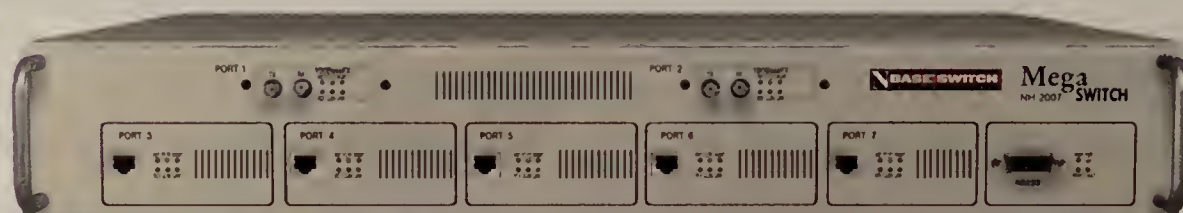
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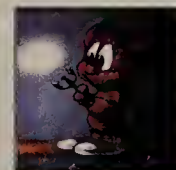
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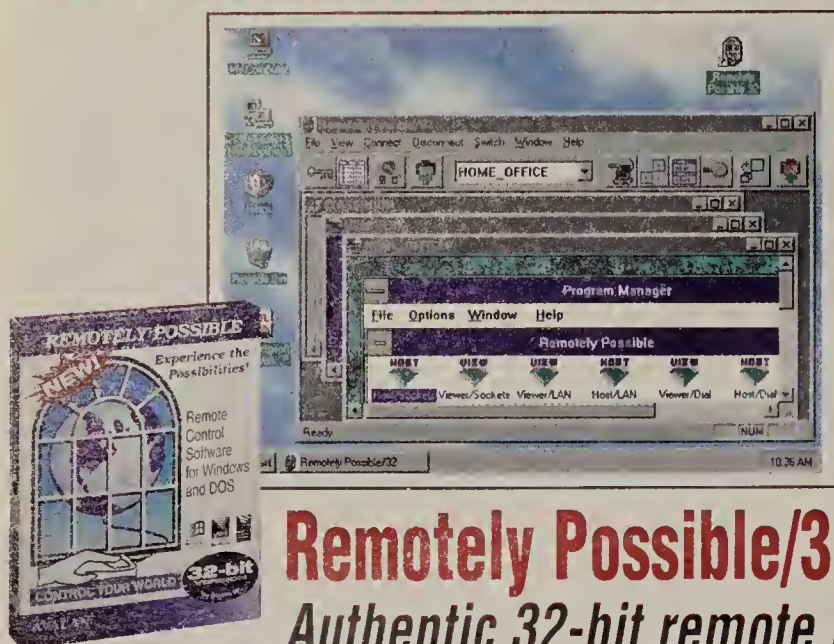
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Steve Rigney, PC Magazine, Network Edition, August 1995

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100VG 32-bit EISA (J2577A HP)	
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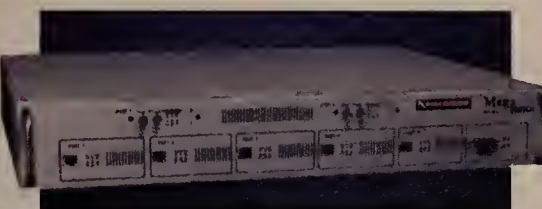
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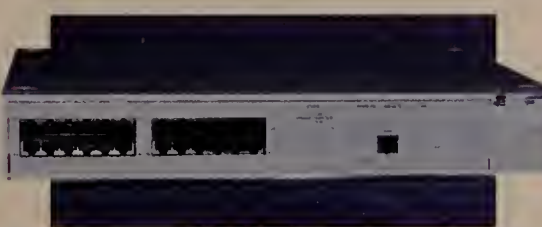
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PROStack EtherSwitch Stackable Ethernet Switch, 16 RJ45, 2 expansion slots for high-speed modules, 10Base-TX/ATM (PSP16-M001)	\$6,370
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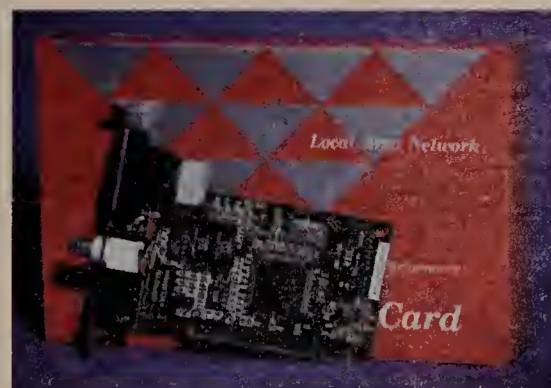
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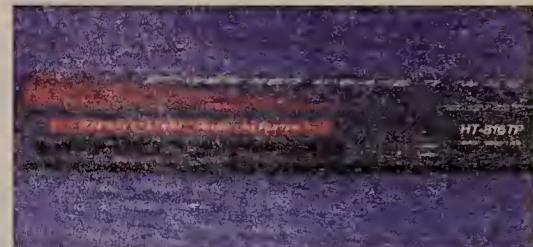
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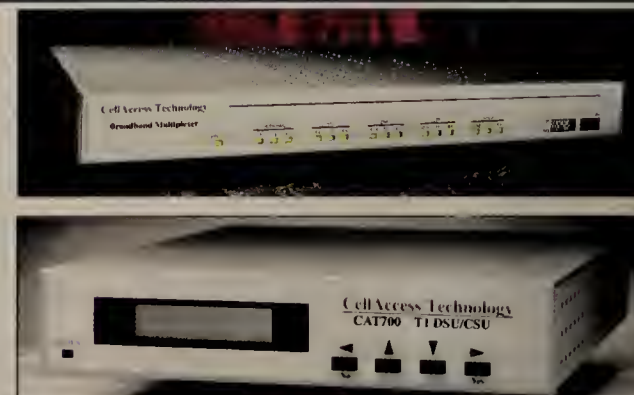
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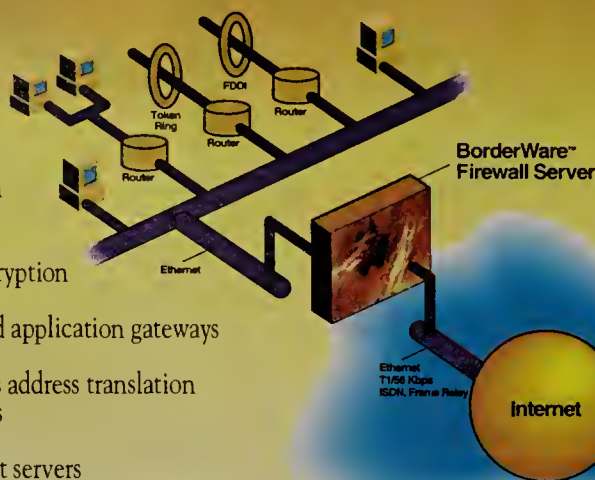
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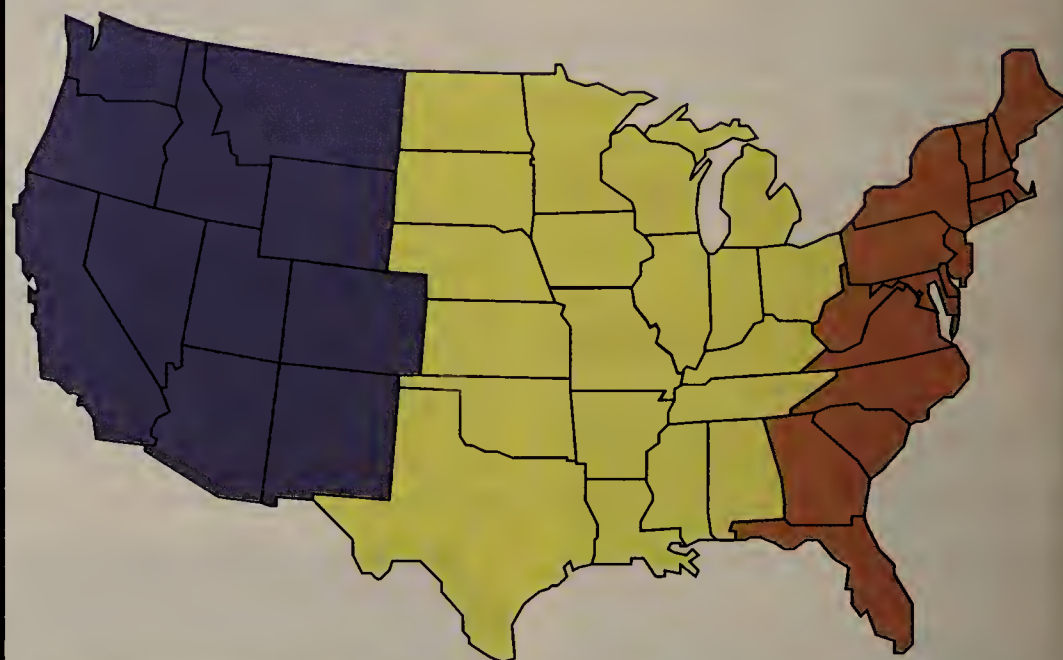
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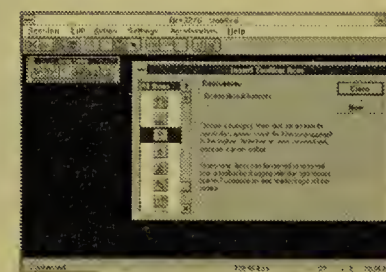
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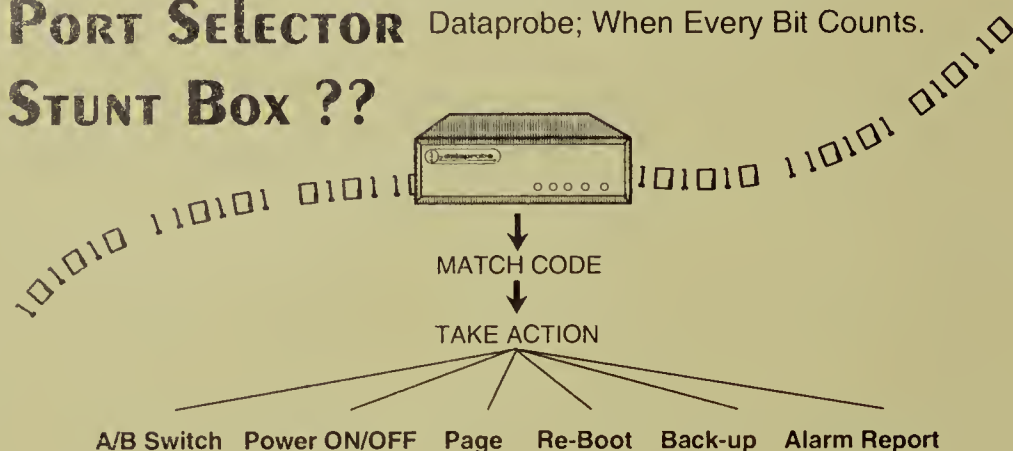
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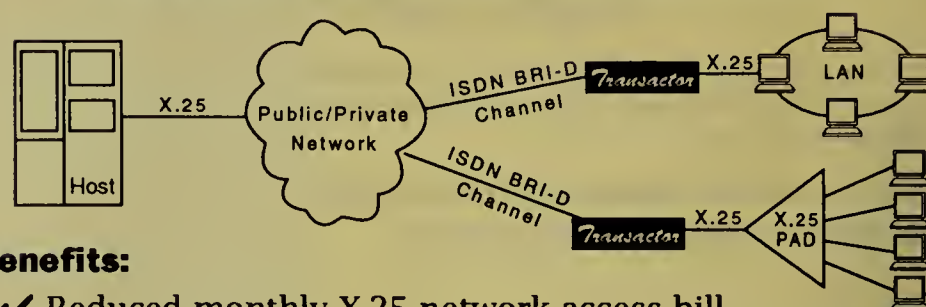
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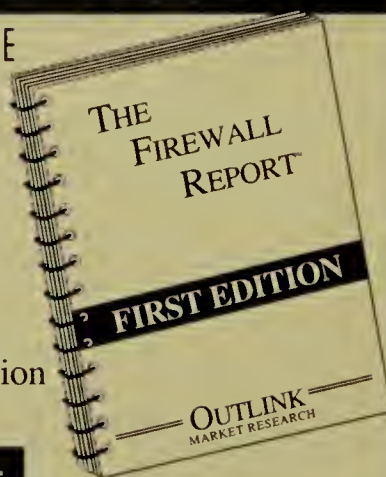
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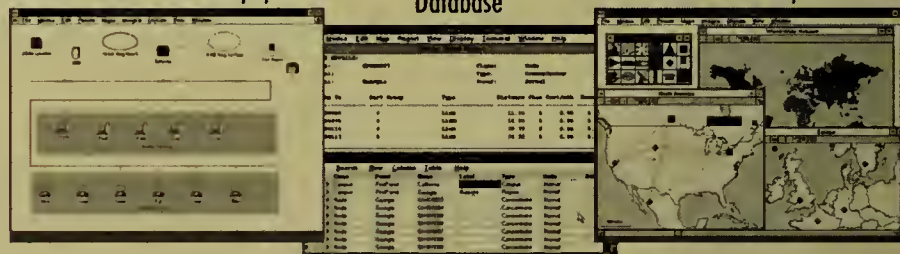
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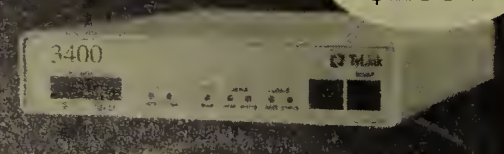
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Intel

Continued from page 1

the management functions they were getting," said Tim Wilson, an analyst at Decisys, Inc., a consultancy in Sterling, Va. "[In deciding] between NetWare and NT, management sometimes makes the difference."

Intel's LAN management software now works exclusively in NetWare environments and also is available as part of Novell's Managewise network management suite.

Intel officials declined to comment on the company's new NT focus, but sources familiar with Intel's plans confirmed the details.

The new Windows NT server agent was designed to feed performance data to a LANdesk Manager console running on a Windows workstation. The console is similar to the LANdesk Manager console that displays data on NetWare nets, but it runs separately, meaning the two cannot consolidate data about NT and NetWare LANs.

The agent, due out by year-end, will monitor preset thresholds defining when an NT server is approaching 100% utilization, for example. It then sends alerts to the console when the threshold is exceeded.

Lighten up

Intel will follow up the new agent with a slimmed-down version of LANdesk Manager, which will carry a small price tag and be aimed at small Windows NT networks.

The suite, due by year-end, will offer network inventory and software distribution, as well as remote control of clients.

However, the suite will not initially offer the software metering, server management, print management and virus protection capabilities of the full-blown LANdesk Manager package. Those capabilities will appear during the first quarter of next year, when Intel ships a full-function version of LANdesk Manager for NT, sources said.

Both NT versions of LANdesk Manager will be able to share information with Microsoft's Systems Management Server (SMS), but the extent of that integration could not be determined at press time.

However, sources said later versions of the NT versions of LANdesk Manager will share a common management database with SMS.

Intel's new management support for NT will be a major boost for NT users since SMS currently has limited server management

capabilities, analysts said. Windows NT has a built-in performance monitoring feature, but the operating system cannot export data to SMS.

The ties that bind

The decision to add Windows NT management to its product line is a dramatic shift for Intel, given its NetWare management focus to date.

But NT support, in addition to its existing NetWare ties, should be a major advantage for Intel in its fight with McAfee and other management vendors, analysts said.

In briefings with analysts, Intel officials are reportedly denying that the company's decision to support NT in any way weakens Intel's relationship with Novell. "But really, the handwriting is on the wall," said one source, implying that Intel would continue to strengthen its management ties to Microsoft. ■

Compaq, Intel join forces on conferencing

By Ben Heskett

Compaq Computer Corp. and Intel Corp. agreed to codevelop and market a series of new products for the PC-based videoconferencing market based on Intel's ProShare conferencing technology.

The combination of Compaq's large presence in the market and Intel's significant investment in its ProShare product could sow the seeds for a fruitful affiliation. But videoconferencing still needs to make the transition from business-specific to everyday workstation applications, officials from the firms said.

"We think that is a several-year path," said Pat Gelsinger, Intel's vice president of the personal videoconferencing division. "We hold a strong view that by the end of the decade, this will be a fundamental element of every PC."

Company officials would not divulge any specifics about the agreement or dates of future product announcements, but Compaq is planning to incorporate ProShare into its packages.

Bruce Ryan, an analyst with San Jose, Calif.-based Dataquest, Inc., said Compaq has long been "very innovative" in its attempts to incorporate leading-edge technologies into its PCs for the business market but previous attempts to bundle various communications software packages have not worked.

Current obstacles for videoconferencing technology include a lack of communications infrastructure and cost, among others. ProShare sells for \$2,000.

But Gelsinger said the technology has already made significant inroads in certain areas of the business market, such as health care, manufacturing-line applications and remote diagnostic settings.

In related videoconferencing news, VTEL Corp. of Austin, Texas, announced a series of new products for its Enterprise series, including Leadership conferencing and the Personal Collaborator. Leadership conferencing offers multimedia functionality based on an open architecture. The Personal Collaborator allows the user to view and talk to another user while sharing the same applications and files at two sites. ■

"By the end of the decade, [videoconferencing] will be a fundamental element of every PC."

VLANs

Continued from page 1

and other problems.

"The idea of defining groups of people administratively and simplifying adds, moves and changes is appealing to most users," said Mary Petrosky, an analyst at The Burton Group in Salt Lake City. "But the way some of these items are worded leaves a lot to the imagination."

Analysts said vendor representatives on the committee are shaping the requirements to fit their current and future LAN switches rather than customer needs. The requirements will be discussed further at the IEEE Plenary Meeting next month in Montreal, which users are welcome to attend.

Based on the existing document, analysts and users are concerned that companies will not be able to realize the promise of VLANs without, for example, reconfiguring their adapters and drivers — a potentially time-consuming process. If the IEEE committee does not change the current wording of the requirement, vendors will have the option of denying customers backward compatibility with their switching devices.

"The VLAN standard will certainly have to require coexis-

tence with existing net devices because you can't be swapping or throwing out things just to implement VLANs," said Blair Sanders, senior technical staff member at Texas Instruments, Inc. in Plano, Texas.

Other users agreed. "If backward compatibility is not guaranteed, then it's going to take a lot longer — if at all — for VLANs to be implemented," said Ram Das Rao, manager of net systems at Boston University.

Michael Schilling, director of technology at the business enterprises group at the University of California at Los Angeles, expects a VLAN solution to support existing hubs and routers. "I should be able to plug any vendor's device into a VLAN backbone without having to upgrade those individual components," he said.

The way in which some of the requirements are worded could also hamper VLAN performance, whereas one of the promises of VLAN technology is that it will enable net managers to eliminate bottlenecks.

"In a virtual LAN, we can group anybody together that we please," said Karl Shimada, a market analyst at Rising Star Research in Boulder, Colo. "But

in the physical reality, we've got to watch out that we don't end up with multiple VLANs being supported on a single physical segment — which could lead to congestion problems."

As written, the IEEE 802.1 document fails to address this issue, he said.

Analysts and users said the committee may need to define a VLAN Management Information Base as part of a robust VLAN management standard aimed at helping users keep an eye on network performance.

The possibility of VLANs having a negative effect on performance worries Schilling.

"I don't think that I would invest in a VLAN solution without also gaining an accompanying improvement in performance," he said. "A successful standard will allow for VLAN management with minimal efforts and staffing requirements that won't allow VLANs to impede performance."

In addition to a net performance boost, many users are looking for VLANs to provide increased network security.

"Right now, to provide users the capability to connect to various servers, you have to give them connectivity to the entire LAN as opposed to specific servers," Schilling said.

"VLANs should help limit users' access," he added.

But The Burton Group's Petrosky said VLANs could potentially raise new security issues. For example, one of the document items implies only switch ports — and not users — can be members of a VLAN. This could

present a security problem in situations where multiple people use the same desktop device, she said.

"If you make the physical device — rather than the user — part of a VLAN, any user who walks up to a workstation is by default able to get at any of the data within that VLAN," she said.

Defining VLAN members by port could also limit the ease of administration users are demanding. The committee could tweak the wording of the VLAN standard to let users become members of a VLAN. This way, users would be able to retain a set of operational parameters as they move around a virtual network.

Trouble in VLAN

Users may find that the virtual LAN standard emerging from the IEEE 802.1 committee overlooks some of their top VLAN requirements, such as:

- ▶ Ease of administration (adds, moves and changes)
- ▶ Improved network performance
- ▶ Security
- ▶ Support for existing net devices

Industry observers stressed that the IEEE 802.1 committee is still in the early stages of defining a VLAN standard, and a completed standard is not expected for another couple years. However, users should pay close attention to the requirements as they develop to ensure that their VLAN expectations are realized. ■

CALLING ALL USERS. . .

Users may attend next month's IEEE 802.1 Plenary Meeting to help shape the VLAN standard requirements. The meeting will be held Nov. 6-10 at the Queen Elizabeth Hotel in Montreal. For more information, call the hotel at (514) 861-3511 or the conference planning service at (604) 527-1045.

Windows NT

Continued from page 1

Microsoft users an enterprise net and systems management package on the NT platform.

NetView for AIX has greater functionality than Microsoft's Systems Management Server (SMS), which is largely aimed at managing desktops and servers. Microsoft plans enhancements to SMS that will bring it closer to enterprise manager status.

SMS vs. SystemView

"SMS can't back up and recover failures. It has no license management, and it can't handle large enterprises like NetView can, so I think we'll be very competitive," said Lynn Wilczak, director of SystemView strategies and plans at IBM.

Don Haile, general manager of IBM's Networking Systems software division, echoed that sentiment at a recent consultants briefing, saying that user demand is driving the development of the new NT manage-

ment platform.

"We don't position SMS as a 'do it all' system, and we view what IBM is doing with NetView as complementary to NT and SMS," said Vesa Suomalainen, general manager of Microsoft's SNA product unit. "It has been tough getting any sort of IBM commitment to NT, so it's good to hear this."

In addition to porting current products to NT, IBM is considering developing another management tool, dubbed SystemView for Intel. It would run on any Intel-based system, allowing users to simply click on the operating system they are running. SystemView is IBM's object-oriented systems and management technology.

"The idea is to have a single SystemView package that runs on any platform, but we aren't at that point yet," Wilczak said.

Embracing NT is something of a competitive necessity for IBM, as well. Hewlett-Packard Co. is expected to deliver a version of OpenView for NT, and

rival SunSoft, Inc. has stated its intention to support Windows.

Industry observers said IBM's nod toward NT is another nail in OS/2's coffin, but IBM denies that, saying the NT offerings will be just another item on the firm's management menu. In fact, its SystemView for OS/2 package will be available by year-end. SystemView for OS/2 is aimed at the LAN management arena and will help users manage Token-Ring and Ethernet-based LAN devices, as well as Novell, Inc. NetWare LANs.

"IBM had no choice in this matter because NT is rapidly becoming the platform of choice for the corporate customer," said Joe Mohen, chief technology officer at Proginet Corp., a software developer based in Uniondale, N.Y. Proginet's primary software package, Fusion, runs under NT.

"The network management vendors who don't [have] a strong management platform for the Windows environment are going to find themselves by

the roadside in two years because Microsoft will be knocking them off with its SMS products," he said.

"Business is business, and IBM needs to make more of these market-driven commitments if it is going to compete effectively," said Frank Dzubeck, president of the Communications Network Architects, Inc. consultancy in Washington, D.C.

Too good too late?

Users were pleased with IBM's NT directions, but at least one thought it might already be too late.

"We are leaning heavily toward DEC's Polycenter manager because we need a more robust system than is currently available from anyone," said David Koptik, a technical strategist at Baxter Healthcare Corp. in McGaw, Ill. "We can't wait for these products to mature because we have a big client/server application rolling out and we need to manage that environment now."

DBMS

Continued from page 1

atop its flagship database. Meanwhile, rivals Sybase, Inc., Informix Software, Inc., IBM and Computer Associates International, Inc. (CA) are readying their own Internet offerings.

Sources said the Emeryville, Calif.-based Sybase will announce its Web tools by year-end. Company officials confirmed that several projects are under way that will likely result in a Web-enabled version of the System 11 database and a version of Sybase's PowerBuilder development tool aimed at building Web applications, as well as tools for building interactive Web pages. Another product will enable users to replicate information from external Web servers into operational databases.

Steve Sommer, vice president of marketing at Informix, said the company has partnered with Spider Systems, Inc. and Netscape Communications Corp. to provide the back-end database for those companies' Web applications. He said Informix is adding enhanced security features to its database aimed at supporting Web-based transactions. In addition, Informix will boost the Web-readiness of the database when it announces support for multimedia data types and objects at the end of November.

Analysts said Web-based database applications may solve problems users have had with client/server applications.

"With the Internet, you put only the [graphical user interface] on the terminal. You're not deploying a large application that has to be refreshed and upgraded," said Richard Finkelstein, president of Performance Computing, Inc. in Chicago.

The Oracle PowerBrowser will include its own scripting language and can be integrated with components developed with Oracle's Power Objects application, too. In addition, it includes a local SQL database dubbed Blaze. The PowerBrowser will be available in January for free.

That tool will integrate with Oracle WebServer, a bundle that includes a workgroup version of the company's Oracle7 database, a HyperText Mark-up Language (HTML) development tool kit, and database and Web administration utilities.

Another offering, the Oracle WebServer Option, is designed to integrate with existing applications built on the enterprise version of Oracle's database.

WebServer and WebServer Option will cost \$4,995 each. The latter is available now on SunSoft, Inc.'s Solaris. Versions for Windows NT and several other flavors of Unix are expected next month.

Beta testers said the Oracle Web tools provide a cost-effective way to deploy applications. "We did not have to write one line of HTML code," said Aron Dutta, a principal in the banking and capital markets practice of Booz Allen & Hamilton, Inc., an

Databases hit the 'Net

Company	Net strategy
CA	Will provide Web access to CA-OpenIngres; in 1996, will release libraries supporting object-to-object connections among OpenIngres databases on the Web.
IBM	Beta-testing Web interface to DB2 databases; recently announced secure Web server.
Informix	Partnering with Netscape and Spider Systems, which are using Informix databases with their Internet offerings.
Oracle	Has developed its own Web browser to ship in January, plus an HTTP server, which ships next month.
Sybase	Expected to announce by year-end its own Web-enabled database to interface with existing browsers, plus capabilities in its development tools for creating interactive Web applications.

international management consulting firm based in New York.

Booz Allen is rolling out a Web-based application to give 3,000 users access to the firm's knowledge base. It uses Oracle's WebServer gateway to pull data from a corporate database and deliver it through a Netscape server to the end user's browser.

Other approaches

CA is looking to object technology as the key to exploiting the Web for its CA-OpenIngres database. It is working on granting Web access to data stored in its database, but it is necessary to extend the relational architecture for the Web environment, said Yogesh Gupta, senior vice president of product strategy at CA, based in Islandia, N.Y.

CA announced in June a project to bolt Fujitsu, Ltd.'s ODB-II object database to OpenIngres' data management engine. So CA is creating a set of libraries to let

objects interoperate over the Web. Object technology will let these Web-accessible databases handle complex data types and multimedia data.

IBM is nearing the end of beta-testing its DB2 World Wide Connection, an interface that connects Web servers with networked DB2 databases running on OS/2, AIX, OS/400 and MVS. More than 1,000 customers have downloaded the software from IBM's Web site, said Drew Clark, IBM's manager of intercomponent marketing.

IBM is fleshing out the Connection product with others. Its recently announced secure Web server and the Internet Connection Server for OS/2. IBM will probably bundle the secure server and DB2 Web connection product, the company said.

Oracle: (415) 506-7000.

Senior Editor John Cox contributed to this story.

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Back to Reality

A B E N D

abend (n) 1: abnormal end to a computer process 2: the column that spares no expense to bring you the insights of Internet users and other high-tech wits

New media strips privacy and image control — even from publishers

My favorite pastime while standing in the supermarket checkout line is sharing headlines from the *National Enquirer* and *Star* with my wife.

My wife, Maggie, shrivels with embarrassment as I read out loud “Larry Hagman Has Ex-Con’s Liver” and “Why Ted Kennedy Was Haunted by Sister’s Lobotomy.” Presumably, the subjects of this puerile journalism are also embarrassed. But public figures often get what they deserve — or what their publicists pay for.

Obscure plebes like us don’t have to contend with the glare of these august publications. But plebes, public figures and corporations alike face the loss of privacy and image control, thanks to the wild and woolly world of the new media — namely, the World-Wide Web.



David J. Buerger

my column and go directly to nirvana by aiming browsers at <http://www.tyrell.net/~robtoups/babe.html>.)

None of the 400 robobabes are on the site’s server. The presentation is based on hotlinks to private home pages maintained by each babe. Most are tame-looking, fully clothed coeds. Apparently, they prefer to use federally funded university networks for digital flirting, rather than focus on getting an education. No, wait — these must be computer science projects.

For those utterly disgusted by these sights, Babes includes a hotlink to the National Organization of Women’s home page. Donate and weep.

(About one-third of ’Net surfers are women, according to a recent study by O’Reilly & Associates, Inc. Expect a follow-on product soon called Hunks on the Web.)

Politics, celebrities and sex aside, there is a lesson here for corporations that are hell-bent on joining the ’Net. Fallout from its uncontrolled use should be top of mind.

Corporate partners, for instance, often provide hotlinks to one another’s home pages. But what if a competitor (or mischief maker) decides to create the appearance of an alliance by hot-linking to your home page without permission?

Attorneys may respond with saber rattling, but Web addresses are as public as telephone numbers.

Corporate honchos are also naive to think potential customers do not share “confidential” Web product support addresses with competitors’ sales reps.

Corporate image, branding, product support and other new media objectives could thus erode if your home page is not protected by a registration mechanism. Hey, no one said new media would be easy.

The public nature of home pages means that some are not used as intended. Industry consultant and writer David Strom, for instance, offers a free home page for the computer trade press and high-tech marketing communications community (<http://www.strom.com>). Despite Strom’s desire, it also contains lots of cool stuff useful to network managers. He dislikes requiring home page registration, which means anyone can read his page. And you should in order to get a leg up on hype coming your way.

The Web is an exciting new communications medium. It also provides the means for publicizing information that some people would prefer to stay private.

Network managers should temper corporate expectations by exposing privacy risks and potential embarrassment. These factors could throw a wrench in fledgling plans for use of new media.

Buerger is an Atlanta-based writer and industry consultant. He can be reached at dbuerger@pipeline.com.



dirtytricks@campaign96.org

I read this subhead in a recent *New York Times* article, which referred to an official-looking Web address, <http://www.dole96.org>.

The home page greets you with the banner, “An Official World Wide Web Internet Site,” followed by “Bob Dole for President — The Ripe Man for the Job.”

The next paragraph states: “Bob Dole is often mixed up with the Dole fruit company. In fact, there is no connection between the two, except maybe that Dole, the Senator, is a big fan of tropical fruits, especially slightly overripe bananas that are just starting to turn black on the outside, but which are not so black and mushy as to be inedible.”

Sen. Dole clearly had no role creating this rogue home page. And Dole’s handlers may squeal “Unfair!,” but the creator broke no law with his charade.

Melinda Gates, billionaire bride of billg@microsoft.com, is also pissed over her and her husband’s ebbing privacy. A West Coast PR firm decided to flack itself into the public eye by electronically publishing photos of the couple’s 40,000-square-foot mansion, now under construction on a bluff overlooking Lake Washington in Seattle.

The Gates’ house is a high-tech version of Hearst Castle. According to the home page, the 95-window (just kidding) domicile has a 12-foot video wall in the reception area to display digitized art, a 20-vehicle garage, a dining room for 200 of the Gates’ closest friends and a trampoline pit where Bill will bounce out new ideas for world domination.

This is the House that Windows Built. Voyeurs can see it at <http://www.morsepr.com>.

Even publishers — be they individuals or corporations — have little control over new media distribution. A telling example is the nude beach of cyberspace called Babes on the Web. (Interested readers can skip the rest of

*The first annual
abend column*

*(wherein we check out all
the usual haunts)*

Your first stop on this Trip of Terror is

(<http://www.primenet.com/~trix/hallo.htm>), which looks to have links to every Halloween Web site in the universe, along with an appropriately garish orange background. Use this as your broom-launching site for Halloween sounds and music, pictures, paintings and even screen savers.

To get further in the mood, check out the coffins for sale at the

(http://shops.net/shops/Carlos_A_Howard_Funeral_Home). Models include the Onyx/Silver Regal Velvet with cathodic protection, semiprecious metal that’s naturally resistant to rust and corrosion, and pin-striped to boot.

Or if going up in flames is more your style, swing over to <http://www.cremationinfo.com> page (The only problem here is that its pages look like they’ve already undergone the treatment — crematoriums obviously don’t employ graphic artists.

<http://saturn.star.net/salem> has its own home page, at <http://saturn.star.net/salem>, but it opens up with a photo of a boring statue of some boring Pilgrim guy. Scroll down a page or two, though, and click on What About Witches for a largely sober look at the witchcraft trials that redeems itself with a large painting of an alleged witch getting hysterical at one of the trials.

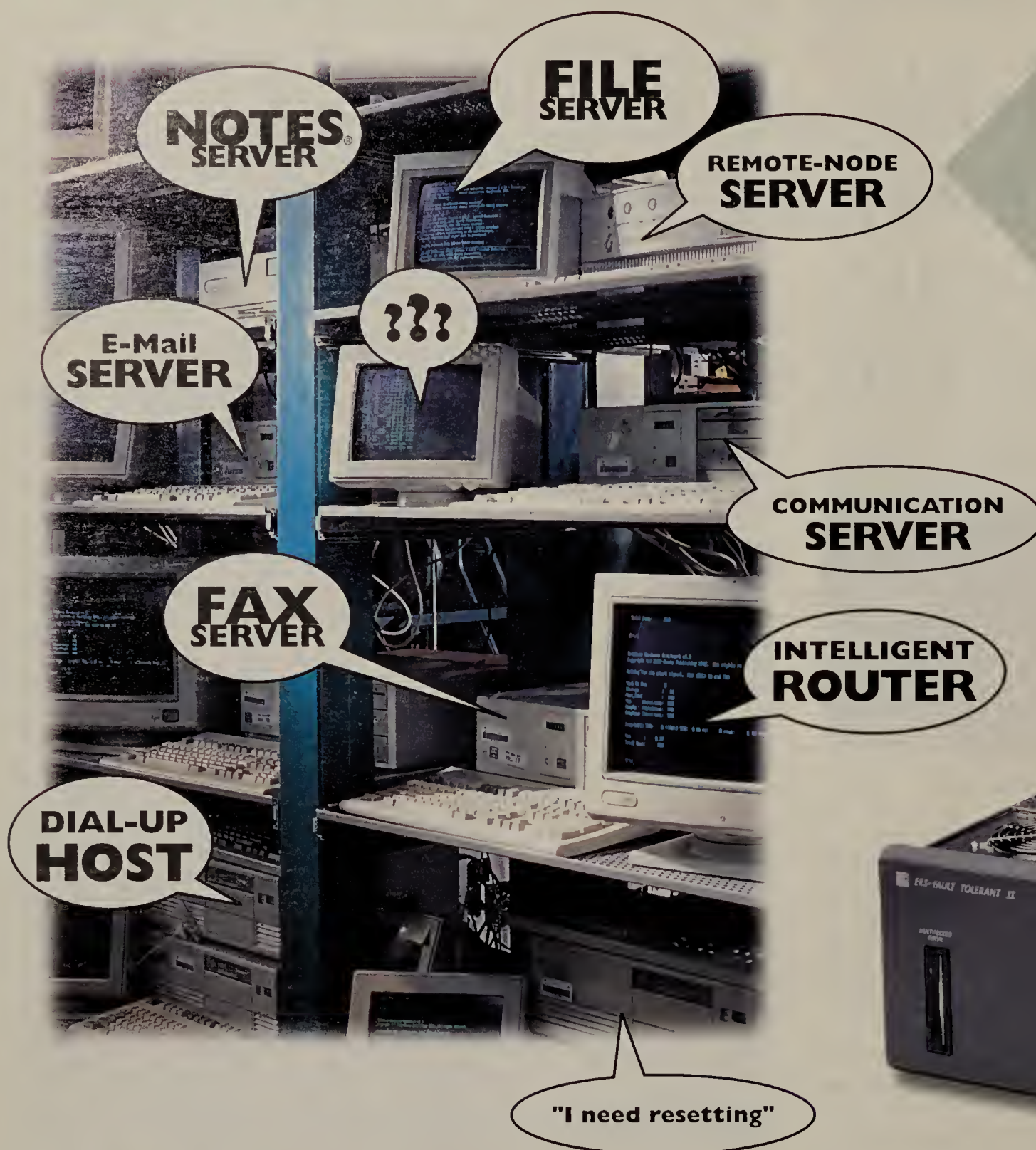
The first thing you see on <http://lucky.biomol.uci.edu>

(<http://lucky.biomol.uci.edu>) is a photo of a guy who’s painted his head orange with black stripes. The frightening thing is that it doesn’t look like he had to do much beyond applying the paint — looks like his head’s already pumpkin- (actually squash-) shaped.

Finally, if you want to pretend you actually learned something from all this, click on over to

(<http://aztec.lib.utk.edu/~michie/halloing.html>), where a real witch tells all about the Druids and Samhain, the night of the dead and all that.

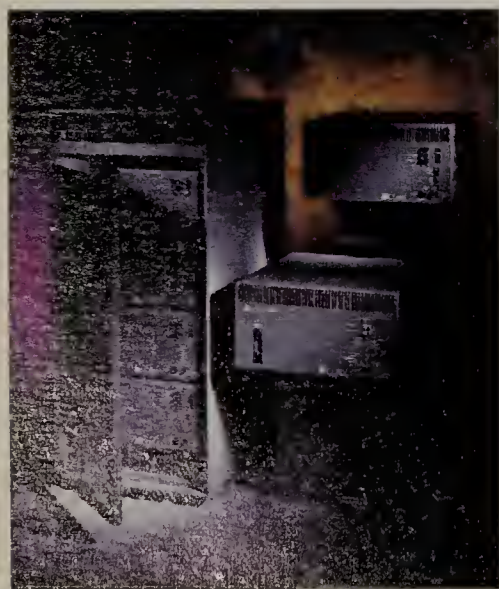
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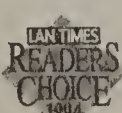
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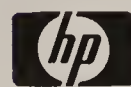
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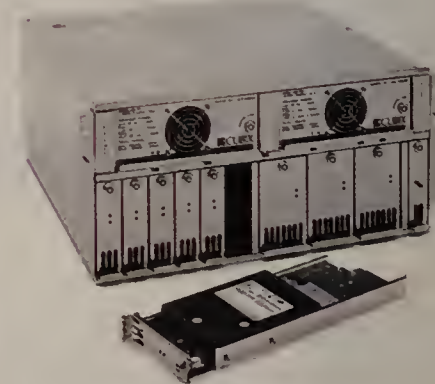
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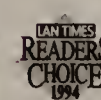
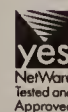
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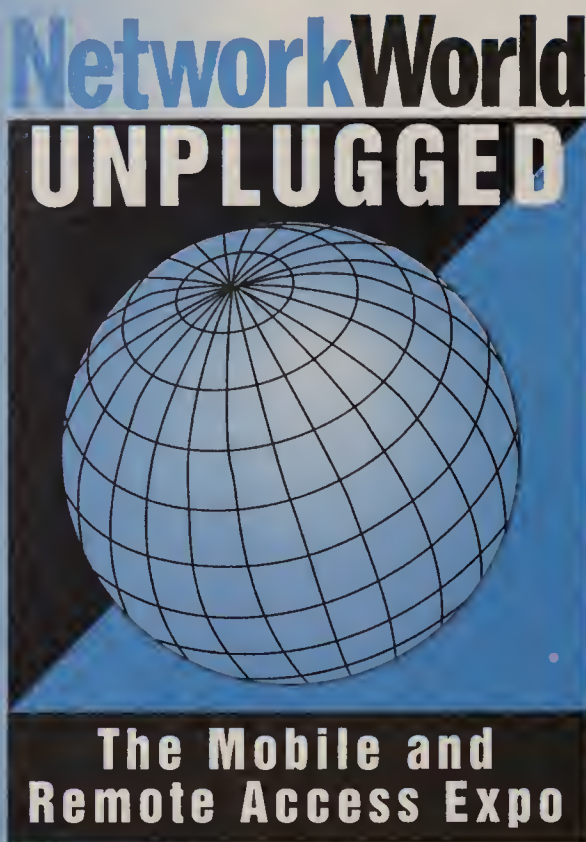
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